Paper Production Scores a Record High

THE year 1936 was the record-breaking year in the paper industry. Consumption of paper products exceeded that of any previous year, as the figures that are now being compiled will clearly show.

In 1929, the previous record year, there was produced 11,140,000 tons. In 1936, on the basis of preliminary statistics, it seems probable that production may reach the staggering total of 12,250,000 tons.

December, 1936, was the banner month of the year. The operating ratio of all the mills of the industry for the week ending December 5 was 90.5 per cent of capacity, and for the week ending December 12, was 91.3 per cent of capacity. For the same weeks a year ago, the figures were 76 per cent and 76.2 per cent respectively.

These high operating figures are not to be wondered at when we scan the operating figures of some of the divisions such as sulphate paper. For the week ending December 19, fifty mills of that division reported production at the all-time high in any division of 102.1 per cent of capacity. For the week ending December 12, the production ran 96.5 per cent of capacity. For the week ending December 5, production was 98.3 per cent of capacity, an average for the first three weeks of December of 98.9 per cent of capacity.

Now, these production figures, remarkable as they are for December, were merely the logical result of the increasing demand for sulphate products.

Beginning with the first week in September last, when the production was 89.3 per cent of capacity, we find in the sixteen following weeks that the average weekly production was 93 per cent of capacity.

The sulphate paper division production for 1936 will approximate 1,105,000 tons. In 1935, the production was 931,325 tons, showing a sheer upturn of 18.6 per cent over 1935.

The 1934 production of sulphate paper was 772,036 tons and in 1933, it was 662,334 tons. So, 1936 production of 1,105,000 tons shows an 18.6 per cent gain over 1935, a 43.1 per cent gain over 1934 and a 66.8 per cent gain over 1933.

The figures on sulphite production, while not quite so dramatic, will be comparably forceful.

Where is the top to the demand for paper products? Who knows?

There is a limit to the paper production and unless all signs fail, 1937 will disclose a critical shortage.

There is today a world-wide shortage of chemical pulps. The entire world's production is sold for 1937, and the production for 1938 is being bought up quickly whenever producers will name firm prices.

There is no danger that the paper industry will suffer curtailment of demand on account of prohibitive prices for its products, for while the demand over last year has increased some 18 per cent, the advance in paper prices generally will average under a 5 per cent increase for the past three years.

The outlook for 1937 for the paper industry is the brightest we have ever seen. The carry-over of unfilled tonnage by the mills is large. After inventory, it will be larger.

Barring any stupid economic toe-stubbing by the coming congress, general business will have a healthy expansion in 1937, and the paper industry will score another phenomenal record-breaking increase limited only by the supply of basic raw material pulps.

+ EDITORIAL +

Strength in Organized Effort

THERE is little opportunity in the average pulp and paper mill organization for any individual to make a stellar play for recognition. Showmanship in the mill seldom finds occasion for expression, since production operations are dependent upon organized effort rather than the spectacular antics of some individual.

Each department of the mill is interrelated in some way. No department by itself turns out the finished product. Rather the finished product is the sum total of the combined work of all departments.

Just as the plant as a whole is dependent upon the smooth functioning of all departments, the individual department is dependent upon the close co-operation of every individual constituting it. Friction within a department prevents it from doing its portion of the work most effectively, and its effect is reflected throughout the entire plant.

Perhaps the strength of properly organized effort cannot be emphasized better than by citing a humorous anecdote about Sam, the colored driver of a mule team, and a white passenger who was riding with him. Sam, seeing a lizard crawling up a tree, deftly snapped off the lizard's head with the lash of his whip. A little later, with equal precision, a horsefly was picked off a fence. Finally, a hornet nest came into range, and the white passenger asked Sam to take a crack at it. Sam, grinning and shaking his woolly head, replied, "No, suh, boss; them fellows is organized."

Retrospection and Anticipation

THE beginning of a New Year prompts many of us to look back over the old year and to balance its accomplishments and failures against one another on the scale of achievement. Sometimes the result is highly satisfactory; but more often it is believed to be otherwise.

Hindsight is so much better than foresight. It is so easy in looking backward to see how things might have been different; how decisions that were made might have been altered; how irritating situations which developed might have been smoothed out without rancor or ill-feeling; how work that was done might have been done more efficiently and satisfactorily; how personal contacts both in and out of business could have been made to be worth much more than they have been; and, all in all, how we as individuals might have nearer approached the truly successful life.

So often retrospection of this kind results in a decision to do one of two things—to swear off from doing some of the non-creditable things and to begin the New Year with a number of resolves set up only to be broken or to go along from day to day without attempting to do anything about the various weaknesses which are known to exist.

Perhaps it shouldn't be a question of deciding what not to do but rather what to do. Negative thought in itself is without force. Positive thought is the energy that starts the generator of achievement and keeps it running.

With the decision made as to what to do, may 1937 prove to be a banner year of accomplishment for all of us who have the courage and the tenacity of purpose to see that the program of action decided upon is put to work.

Good Place to Work

A RECENT trip through a new pulp and paper mill left a mental impression with the visitor that will not be forgotten. It was an impression that was gained not from a hurried trip through the mill or from a visit to certain departments. Neither was it gained from anything that was said by any one connected with the mill organization. In actuality, it was stimulated from a stay of several days at the plant and the opportunity granted by the management to visit each and every department and to loiter in each one as long as desired.

This impression, putting it tersely, was that any pulp and paper mill worker should be proud of the opportunity to work in such an establishment.

The mill was well-lighted. Walls were well-painted. Plenty of room was allowed around every machine. The equipment had been selected carefully. Safety considerations had not been overlooked. Everything within and without the plant was conducive to a feeling of security and of comfort insofar as industrial work can be made comfortable.

How different are the working conditions in some of the mills from those which have been mentioned. There are cases of obsolete machinery, poor lighting, poorly painted walls, narrow aisles and crowded working conditions, and inadequate safety provisions.

Could it be said by employees in mills of this latter kind that "We are proud to be working under such surroundings?" The answer is "No" and it is believed that this negative tone is reflected in the quality and quantity of work of the individual so employed.

Make your mill, if it is not already so, a plant in which employees will be proud to work. You will find the change reflected throughout your entire organization and you will wonder why it was not done sooner.

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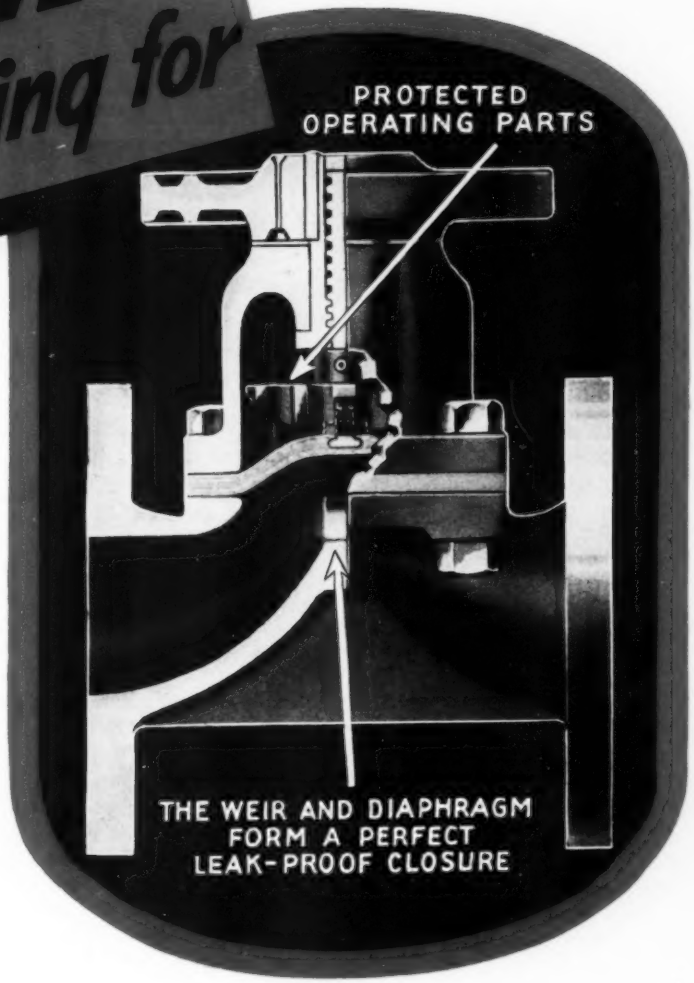

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More Retrospection Than Introspection

WILLIAM SIBLEY

WITH the relentless, unfaltering tread of Time another year is before us. It does beat all how these calendar leaves fall! When we were back in the friendly years of eight to eighteen, our care-free hearts yearned for the years to pass more quickly, that we might be older and more freely do the things we wanted to do without parental influence. Now when our perspective has changed to that of "parents" we resent the rapidity with which the numerical strength of years change; we seek not so much to go back to where we once were as to stay where we are. But Time laughs at both Youth and Age, and with unabating, unhesitating precision ticks off his steps with recognition for no one's personal likes or dislikes.

To the Sibley household, as to most others, Santa Claus paid a recent (and rather hasty) visit. Children being the necessary ingredient for Christmas, and we having none, Santa Claus, to us, has been known to be a fakir who went up the flue several years ago. In our tiny steam-heated billet, he takes on a more practical cloak. Instead of giving other people things we would prefer to keep ourselves and receive in return a bunch of junk we really don't want, Mrs. Sibley and I have become accustomed to the habit of giving each other books. She gives me books *she* wants to read, and I reciprocate by giving her books *I* want to keep. The arrangement is a bit unorthodox, but for us much more satisfactory.

And under that peculiar arrangement I played Santa Claus to the extent of presenting Mrs. Sibley with a copy of H. L. Mencken's *The American Language*. Parenthetically, I heartily recommend it to anyone literate enough to write a letter. And having something of a tussle with Old Man Flu on Christmas Day I spent the majority of the hours in bed—reading that very interesting, and manifestly exhaustive, work. And between spells of reading in bed, and between pounds of my aching head, I let the book take its course and send me back to the days when Christmas was truly "Christmas;" to the day when many of the words discussed, analyzed and parsed by Brother Mencken did not exist.

. . . Back to the days when there were no such things as "insanity dodges," traumatic hernias, and pneumoconioses. Nor such things (at least in common use) as radio, diesel power, metabolism, endocrine glands, fascism, so-called "old-fashioneds," and the disturbing multiplicity of prating "commentators" who now fill the ether waves with half-truths. Nor yet such things as stratosphere, bathosphere, lie-detectors, shovel leaners, rumbas, chromosomes, truth serums, psychoses, or brain-trusters. Thinking thus, I rested there in my too-warm bed and thought:

. . . how we used to know "skins we loved to touch" but didn't appreciate that fact; how we used tobacco that didn't have a cough in a carload, but only because at that time our tobacco came in square plugs decorated with a little bright-tin horse-shoe, or a star; how we used to glue our eyes to well-focused double pictures of Niagara Falls or the Eiffel Tower, instead of scanning the pages of the new-born *Life*. . . . How we used to get up at 5 a. m. and milk Old Bossy, Mooley, and Horney—then strain the pail of creamy goodness through cheese-cloth and peddle it to the neighbors at 5 cents a quart (with a liberal dash put in the crock for good measure). How we used to sneak down cellar on the way to school and fill our pockets to bulging with the choicest of the Northern Spies (from a barrel which had cost father $2.10—barrel included!) Then, later, coming home for ginger cookies, hot doughnuts, or a slice of bread spread liberally with plum butter—only to have mother endow us with a dime with which to get some round steak at the meat market for the evening dinner. . . . And that little thin dime would buy all the meat five of us (not including two dogs) could eat.

No—back in those days our alphabet was still an alphabet, entirely unused for such things as WPA's, NRA's, AAA's, CCC's of PWA's.

And should there, on very special occasions, be collected in our "sitting room" a group of people who could collectively play the piano, violin, cello and guitar—very presently we would find our front lawn quite filled with listeners-in. Such an ensemble would collect a crowd on any summer evening; whereas today we may walk down the street and be within ear-shot of everything musical from Cab Calloway to Toscanini. And no one halts a step because he knows that at the flip of a finger his own living room may be filled with music both masterful and mediocre.

Ho-hum, what a hodge-podge of unrelated memories linger. . . . There I am, hanging over the gallery rail, enthralled with the performance of Richard Carle . . . or falling off Bonnie in to the mud before Her-Whom-I-Worshiped . . . or enjoying the transient fame that attends the football hero when being helped off the gridiron with a broken nose . . . or enjoying the incredible forgiveness of my mother. My mind, during this holiday season is akin to Omar's wind "across the waste, willy-nilly blowing."

But—maybe if we reactionary ancients can hold to the memories of our youth, we will have a bit more patience with those who grope after us.

THE PAPER INDUSTRY
A MONTHLY EDUCATIONAL JOURNAL

The Library in the Paper Industry and Related Fields

CORIENNE CASPER, Librarian
U. S. Gypsum Company

TODAY, the business man is faced with a host of economic problems. Never in the history of business have there been so many complex changes, all of vital importance. The key man in industry is ever watchful of his own business, always making plans for economies, expansion, and the development of larger, improved lines of products. But as change is inevitable within a business, so is it ever present in the business world as a whole. While the executive is devoting his time to the study and management of his own business, there should be someone else in the organization who is watching outside developments in business conditions, markets, and competition. The special librarian is the person who can serve best as the connecting link between an organization and the outside business world.

Development of the Special Library

Although business men believe the office library is a recent innovation, the fact is that the first special library was in existence as far back as 1855. It is not certain in what line of business the first library was introduced, but it is known that a public utility in Chicago and an old accounting firm organized two of the first libraries.

Business men may find significance in the fact that office libraries have grown most rapidly since 1934. Of all the business libraries in existence in 1935, ten per cent of them were organized prior to 1910. Between 1910 and 1921, another forty per cent was added, and between 1920 and 1935 the other fifty per cent came into existence. The year 1934 took a heavy toll among business libraries, but far more were created than were discontinued.

Need for the Business Library

The library, like any other unit of a business organization, must justify its existence. That the most rapid growth in their organization has taken place since 1934 is strong proof that business management feels a need for the service, as a result of trying to provide information pertinent to its particular business field.

Experience has shown that in attempting to provide employees with information without the special services of a librarian the business office is confronted with certain difficulties. Briefly, some of these problems are:

Needed material scattered throughout an office and not centralized is thereby inaccessible to most employees.

Duplication of information results.

Most of the books, pamphlets, and magazines tend to disappear.

Available material is apt to be inadequate.

Time is lost when employees untrained in gathering material attempt to find available information.

Employees need such information but generally lack the time or the ability to find it.

Employees are discouraged or delayed in developing ideas when needed information is difficult to obtain.

Functions of the Business Library

It is the function of the business library to sell itself and its services by eliminating these and all other difficulties arising in the collection of data germaine to the business. It is, therefore, the duty of the library to keep the organization abreast of the latest written contributions useful to the business. If the librarian can do this quickly, economically, and adequately, his or her services soon prove themselves essential.

In view of the fact that the commercial library is a very new development, it is not surprising that its functions are little understood. For this reason there is uncertainty in fitting it into the organization.

The Place of the Library in The Business Organization

Here, too, experience has shown that to place the business library in charge of general office service is unsatisfactory. It is true that the library is a service unit, but its work is variable and does not lend itself to the same type of control that is applied to office service.

Actual study of business library organization indicates that good results are obtainable when the responsibility for the library is placed with an executive officer who makes extensive use of the library. An alternative plan is to have the library under the direction of an executive who circulates frequently about the office and is in position to know the work of the library. Either method of control insures a well-rounded development for the library service, closely corresponding to the needs of the business.

Personnel

The size of the library staff will vary from a full-time librarian and a part-time assistant to six or eight and sometimes thirteen persons. Usually a librarian and one assistant can carry on the work.

The librarian's qualifications should consist of formal training and experience. Education should include professional library economy with a background of liberal arts and science. In the paper industry a reading knowledge of French and German is recommended, and a familiarity with industrial chemistry is helpful.

The librarian need not be and preferably should not be a filing specialist. If the librarian is expected to undertake general filing supervision in conjunction with the library work, both jobs suffer. The professional training received is adequate for library purposes. Again, training in science should not be considered a major part of the librarian's equipment. The same experience is encountered when scientific research is coupled with library work. Filing supervisors and chemists have attempted to operate the general office library with indifferent results.

Emphasis should be placed upon the librarian's reference experience, because it develops resourcefulness. Inquiries are sometimes unusual and hard to answer, and the seasoned librarian is more likely to be successful when reference training is added to actual work. When it is further remembered that executives expect someone who is resourceful, alert, and capable of meeting the men and women in the office on their own ground, it is readily seen that training in library work alone is no guarantee of success.

Introducing the Library

When the library is first organized in the business, it is suggested that the office prepare a mimeographed bulletin describing the service to be rendered. This should be distributed to department heads and others with employees under their direction. The library collection, and the service to be rendered, should be explained and the privileges to be extended to employees should be fully described.

The Library Collection

The library material usually consists of books, periodicals, pamphlets, clippings, photographs, reports, and surveys.

◆ BOOKS should be added to the library shelves on a very selective basis. Records of business libraries show that as the library becomes seasoned, the book collection represents a constantly decreasing portion of the total material available. Only those volumes pertinent to the business, related fields, and business in general (on a restricted basis) should be acquired. Suggestions and recommendations of employees are prime factors in the selection of books. Books tend to deal with the standard, the general and the well known and, therefore, may add little to the knowledge of the staff. Irrelevant matter on the book shelves gives the wrong impression as to the value of service rendered and reduces the prestige of the library. Even books in point should be purchased sparingly. The demand for the books and the rate of obsolescence are to be considered. Borrowing from outside sources may be more practical in some cases. A cautious buying policy results in the accumulation of books of permanent value.

In small communities without benefit of large metropolitan reference and business libraries the trained librarian is of even greater service. University, state and some other libraries throughout the country co-operate in lending material. Add to this service the information obtainable through various other outside sources known to the trained librarian, and fact-finding for a business in an outlying community assumes importance.

Of course, certain standard volumes are indispensable. These are the working tools with which the library begins. In this group are included the *Industrial Arts Index;* a reputable, standard, general encyclopedia; a general almanac; an unabridged dictionary; *Chemical Abstracts;* the *Engineering Index;* engineering handbooks; and, particularly, for the paper industry, Crane and Patterson's *The Literature of Chemistry,* West's *Bibliography of Pulp and Paper Making,* and sometimes the *International Critical Tables.* The paper man will readily name a number of important and indispensable books for his office library. When the librarian begins gathering a nucleus for the library, many of these publications will be found scattered throughout the offices. These can be collected in the library as they are of general reference value and are widely used throughout the office.

Author and subject card files are necessary. These may be purchased from some large library that prints cards for its own use or they may be typed in the office. The books are given a classification number and pre-

pared for use by adding pockets and record cards.

Perhaps the Dewey Decimal System is more widely used than any other for classification of books in a small business library. At any rate, it lends itself admirably to this purpose and is recommended for the office library. It may be simplified or expanded to suit the needs of the office collection.

◆ PAMPHLETS constitute one of the most important items of the office library. This is because the sources of greatest importance in any business library are printed association reports and research surveys and findings. The pamphlet file is adaptable to a high degree of specialization and provides recent, new and pertinent information. The material found in pamphlets is not likely to be duplicated in other sources. Even the seasoned librarian is at times surprised to find the answer to a troublesome question in the pamphlet file. The librarian will find diligent and methodical collection of pamphlets profitable. They must be gathered currently, as stocks are quickly depleted and publishers' names are lost. As costs are small or pamphlets are often free, they should be collected assiduously. The value of this file grows with the size and scope of the collection. In time many pamphlets of the business will be covered, and subjects on which material is difficult to locate will be included.

Pamphlets are obtained through magazine notices, state and national government publications, business associations, office associates, university bulletins, reports of projects in progress at experiment stations, as well as foreign publications.

A superficial examination of the pamphlet file discloses titles on legislation, bibliographies, statistics, costs, company products, credits, distribution, economics, geology of company products and regions of raw materials, management, labor relations and laws, marketing, office management, pensions, profit sharing, safety, wages, specifications, and many others. It can readily be seen that in time this collection becomes very valuable.

◆ PERIODICALS are even more important than pamphlets. They are relied upon for information on current activities and developments in the business. The tendency is to subscribe to all magazines of interest to the business, and occasionally one of general interest is taken on a trial subscription. It is the librarian's responsibility to place and renew subscriptions for all periodicals of proven worth and to locate the most reliable magazine subscription agent.

The librarian examines as many issues as possible for articles of special interest. The name of the person to whom an article is of particular interest is placed on the route slip and attention is called to the title and page number. When this person is through with the magazine it is returned to the library and routed again. This insures orderly and more rapid circulation and prevents loss of issues.

When a number completes circulation among employees, articles of future value are clipped and mounted for file. A record of important magazine articles is kept in a subject card file. Magazines of particular value are bound.

◆ PHOTOGRAPHS constitute an interesting and useful collection. Pictures of plant interiors and exteriors, equipment, layout and plants under construction are in demand. These are most often consulted when new equipment is added or in the preparation of advertising copy. It is practical to file them by geographical areas.

◆ NEWSPAPER CLIPPINGS obtained from commercial clipping bureaus are valuable in several ways. They are a source of information on competitive products and on topics of special interest. Clippings are an excellent check on publicity given the company and its products. The service is an efficient and economical method of gathering information on a broad scale. It is at times an important part of the library collection.

The True Field of the Library as a Central Depository

Sometimes it is said that all information pertaining to company business, except the most confidential, should be collected in the library. Practical experience is not in agreement with this policy. Some data are highly specialized and of little general value. On the other hand, a department may refer to material frequently, and it is troublesome to transfer the files to the library. Again there is the practical difficulty of pooling all files and publications in the library when these are scattered throughout a large office. This difficult task is unnecessary. An alternative plan is for the librarian to index material filed in various departments. This is done on special cards in the subject index. As the librarian becomes familiar with the various office files, the card index will come to contain an important collection of cards designating material in possession of various departments throughout the offices. This point of centralizing all material in the library is closely allied with the question of how many books to buy.

Scope of the Library

Too much emphasis cannot be placed on the fact that the most valuable equipment of a librarian is a knowledge of sources of information. It is, therefore, not necessary to accumulate great stores of printed matter. The efficient librarian devotes much time to study of standard checklists of publications, digesting current periodicals and pamphlets. The librarian is also familiar with public and private libraries, business associations, government bureaus, and trade publications, all very valuable sources of information. When a librarian knows what is being published and where it is obtainable, he or she is equipped to undertake general research, an important part of the duties in an office information service.

Library Research

An analysis of the type of problems requiring research shows that they fall into two or three broad classes. Considerable time is devoted to finding material on the use of company products in new and unusual fields. Research is frequently necessary on various types of statistics, labor relations, personnel problems, methods of compensation, occupational diseases and costs. The research is not technical or original but consists in gathering, digesting and arranging information for convenient use.

The Library Bulletin

It is found that employees readily read notices on topics of interest to their departments. A practical method of preparing this service is to devote single issues to one topic. For example, an issue might be devoted to pending and recently adopted laws of interest to certain executives. A succeeding number might be limited to new and improved products. The distinguishing point in this suggestion lies in the limitation of an issue to one topic and restricted distribution to interested departments. This policy makes the service more attractive to the recipients and tends to retain a uniform quality of subject matter. The objection to a general bulletin issued at regular intervals is that much of the material is of no particular interest to many of the departments, and the pressure of regular issues becomes a burden.

The service may be prepared in the form of digests or bibliographies or both. The advantage of bibliographies lies in that only articles of particular interest are ultimately secured. When digests are prepared, very often the full text is requested, so that no particular time has been saved.

A Day in the Library

Since this article is devoted to the business office library, it may not be amiss to describe a typical work day devoted to finding information for company employees. The routine work consists of magazine filing and digesting the articles of particular interest. Cards are made for the library index. New and old magazines are routed, and letters requesting material written.

Most requests for information are received by telephone, or the librarian is requested to come to the office to discuss a certain problem. One department requests statistics on the amount of raw material produced in a foreign country in certain years, the location of a dam, information on how to avoid sagging in freight boats, and properties of certain products. Another department requests information on government departments, production and sales figures and a subscription to a periodical be placed. A third department asks general material on a certain product, orders photostats of several articles, places a subscription to a magazine, and requests a list of given manufacturers. A fourth department needs a history of raw material in three states, and another department only wishes to obtain a book. If any requests cannot be filled from library files, outside library research is necessary.

Libraries are now maintained by a good many concerns. Classified by types of business, we find them in the building material industry, plumbing manufacturing business, utilities, banks, security and mail order houses. Libraries are maintained in certain branches of the transportation field, in the insurance business, by advertising concerns, printing establishments, office appliance houses, accounting firms, chemical concerns, and in fact by some 1,500 leaders in a good many types of business. Quite a number of these are in metropolitan centers where many great libraries are open to the public. For the business with headquarters in the small community the need for a library service is even more pronounced.

The paper industry, too, has made a beginning. But as many plants and offices are in communities with limited library facilities, there is a great need for librarians who can draw upon the widespread store of information throughout the country. Other lines of business have been the testing ground, and now the paper industry may benefit from this experience.

◆ ◆ ◆

Care of Films and Filmslides in Libraries

REFERENCE libraries of the future may contain files of photographic films in addition to shelves of the conventional books, if the present trend toward the use of films for recording and copying the printed word continues. Hence, it appears that librarians are to be confronted with the problems involved in the case of records on photographic films. Some of the problems have been studied at the National Bureau of Standards, and the findings are reported in a paper by C. G. Weber and J. R. Hill which was presented by the former at a recent meeting of the Society of Motion Picture Engineers.

The cellulose acetate film used as filmslides for records is hygroscopic. It adjusts its moisture content to conform to the humidity of the surrounding air, and changes in moisture content affect its properties.

The film is brittle under the conditions often encountered in rooms without air-conditioning, making control of the moisture content essential. The conditions suggested for storage and use of film are those recommended for the preservation of books in libraries; namely, relative humidity of 50 per cent and temperature of 70 deg. to 80 deg. Fahr. However, libraries without conditioned air can get satisfactory performance by storing the filmslides in humidified cabinets or small rooms in which the relative humidity is not permitted to drop below 50 per cent. Control of temperature is not considered essential, except that extreme variations should be avoided.

The emulsion side of film is easily scratched, and despite care in handling, projecting, and cleaning to minimize abrasion, filmslides accumulate scratches. The positives in constant use may require occasional replacement; hence negative films of important records should be carefully preserved as a source of replacement.

Nitrate film is perishable and highly combustible. Storage of this type of film should be undertaken only in approved fireproof cabinets, and these should be within vaults of fireproof construction. Low temperature and low relative humidity are recommended to retard the deterioration of film in storage. Film containers for nitrate film should be vented to permit free escape of the products of decomposition (principally oxides of nitrogen) since their presence accelerates deterioration. It appears advisable to preserve pictures of permanent value by making negatives on acetate base, because of the perishable nature of nitrate film.

The paper has been published in the November issue of the Bureau's *Journal of Research* and also in the December *Journal of the Society of Motion Picture Engineers.*

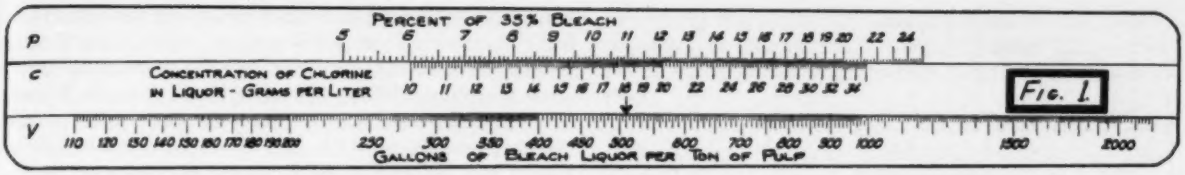


FIG. 1.

A Bleach Liquor Slide Rule

O. K. GRAEF

THE quantity of bleach liquor required for any given pulp may be found from the relation

$$V = \frac{838.8\ p}{c}$$

Where V = Gallons of bleach liquor required per ton pulp.
p = Per cent of bleach consumption expressed in terms of 35 per cent bleach.
c = Concentration of chlorine in the liquor in grams of chlorine per liter.

In the laboratory or testing station, it is the practice to determine the bleach demand for a given pulp, then to determine the grams of chlorine per liter, and with a slide rule solve the above formula for gallons of bleach required. A slide rule designed expressly for this purpose has been found to be of considerable service in laboratory and testing stations, as its use tends to reduce the likelihood of errors.

In making this slide rule, it is first necessary to throw the formula into the basic form for slide rule plotting.

$$\text{Log. } (838.8\ p) - \text{Log. } c - \text{Log. } V = 0$$

From the form of this equation, it is evident that the scales will necessarily be logarithmic scales rather than uniform scales.

The direction of increasing values of the scales must be determined by forming the key.

Top section of rule stock	—Log (838.8 p)	+ →
Top half of slide	+Log c	— →
Bottom half of slide	—Index	+
Bottom section of rule stock	+Log V	— →

Upon adding direction arrows at the side of the sign corresponding to the sign of the function in the basic equation, it is found that all of the scales will increase to the right.

Limits must be set up for the values of the variables, and the following have been assumed in the case of the rule illustrated in Figure 1.

p to vary from 5 to 25
c to vary from 10 to 35
Then V will vary from 838.8× 5/35= 119.8
to 838.8×25/10=2097.0

A modulus or base length must be selected, and the total length of the scales must be calculated to this base, so that the over-all scale lengths will not exceed the over-all length of the rule blank on the one hand, nor be so small that there will be difficulty in reading the scale divisions, on the other hand.

In Figure 1, a 14-inch long rule blank has been used. If a 12-inch blank is used it will be necessary to use another and smaller modulus for construction or some of the scales will exceed the length of the shorter rule blank. Since these scales are logarithmic, reference to a 4-place table of common logarithms will assist in determining the over-all length of the scales. Scale p is to vary from 5 to 25, and if a scale modulus of 20 inches is selected, then

20″×Log 25=20″×1.3979=27.96″
20″×Log 5=20″×0.6690=13.38″
Length of scale p =14.58″

Scale c is to vary logarithmically from 10 to 35, and to a modulus of 20 inches the scale length will be

20″×Log 35=20″×1.5441=30.88″
20″×Log 10=20″×1.0000=20.00″
Length of scale c =10.88″

Scale V will vary logarithmically from 119.8 to 2097.0, say from 110 to 2100,

20″×Log 2100=20″×3.3222=66.44″
20″×Log 110=20″×2.0414=40.83″
Length of scale V =25.61″

These scale lengths are, in the cases of p and V, in excess of the length of a 14-inch rule blank, and, therefore, a smaller modulus must be used. If a modulus one-half as great, 10 inches, is used, then the scale lengths will be reduced proportionately, or

p scale=10″/20″×14.58″= 7.29″
c scale=10″/20″×10.88″= 5.44″
V scale=10″/20″×25.61″=12.80″

The lengths thus determined are within the length of the 14-inch blank, and for the rule illustrated a 10-inch modulus was used. If, however, a blank only 12 inches long is available, then a modulus smaller than 10 inches would have to be used, say 8 inches, and the over-all length of the scales would be

p scale=8″/20″×14.58″= 4.83″
c scale=8″/20″×10.88″= 4.35″
V scale=8″/20″×25.61″=10.24″

With the scale modulus selected as 10 inches, it is only necessary to refer to the 4-place table of common logarithms, and with an engineer's scale plot the equivalent lengths of scale proportional to the values of the

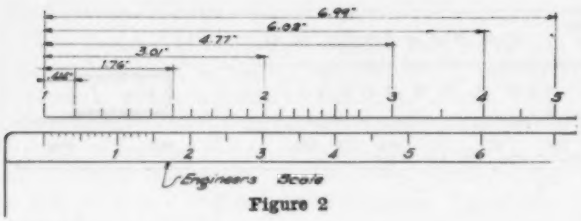


Figure 2

functions. Figure 2 illustrates this procedure quite clearly.

On a standard polyphase slide rule, the A and B scales are graduated to a 12½ centimeter (5-inch) modulus; the C and D scales to a 25 centimeter (10-inch) modulus, and the K scale to an 8-1/3 centimeter (3-1/3 inch) modulus. Therefore, in this case where a 10-inch modulus has been selected, the C or D scale of a standard slide rule may be used. The scales being taken directly from the standard C or D scale by means of dividers and transferred to the paper scales being drawn for the p, c and V functions.

If the 8-inch modulus is used, it is necessary to plot the scales from a table of common logarithms, similarly to the method shown in Figure 2, or to construct a variable logarithmic scale as shown in Figure 3. A variable logarithmic scale of this sort may be easily prepared and may be used in the preparation of scales to any modulus above 3 inches. To construct this chart, erect a perpendicular BFD to a base line ABC. The height of the perpendicular to be 20 inches. The line BFD should be penciled lightly as it is a construction line and will be erased when the chart is completed. The position of BFD on the paper now represents the midpoint of the scale or 3.16+, the logarithm of which is 0.5000. The line BFD is divided into 20 spaces each exactly an inch long, and the 1 inch units are subdivided into 10 divisions each representing a tenth of an inch. At the 10-inch division draw line EFG parallel to ABC and of the same length, and on this line construct a logarithmic scale, using dividers and the C or D scale of a 10 inch standard slide rule, or the method of calculation from a table of logarithms previously described, locating the origin of the scale where 3.16+ coincides with the perpendicular BFD, and extending the scale to either side of BFD equally. With point B as a focal point, extend rays to intercept the logarithmic divisions laid out on EFG, prolonging the rays to the 20-inch line. Parallels should be drawn through each of the 1-inch divisions on BFD and extended to the boundaries of the chart. The subdivisions representing tenths of inches on BFD should be extended to the boundaries of the chart and marked as ticks on the boundary lines.

The chart should be inked carefully and the lines on the chart should be made as fine as can be made with a ruling pen. Lines representing units should be made very slightly heavier than lines representing minor subdivisions. Note that for clarity, the chart shown in Figure 3 has been only partially completed.

When using this chart, if the 8-inch modulus has been decided upon, it is only necessary to fold the chart on the 8-inch line and tick off the values from the 8-inch line of the chart on the base line of the scale being constructed. As an example of the use of this chart for constructing scale p to an 8-inch modulus; fold the chart on the 8-inch line, then as p increases from 5 to 25, start at 5 on the chart and tick off the chart divisions on the base line of the p scale up to 10, then shift the chart so that 1.0 of the chart is opposite the 10 of the scale and again tick off the chart until 2.5 is reached. In marking the scale, begin at 5 and number to 10, then number 10 to 25, the numbering being placed opposite the main divisions of the scale. This may be done because the distances from 1 to 10; 10 to 100; 1000 to 10,000, etc., are all equal and therefore this chart may be used for

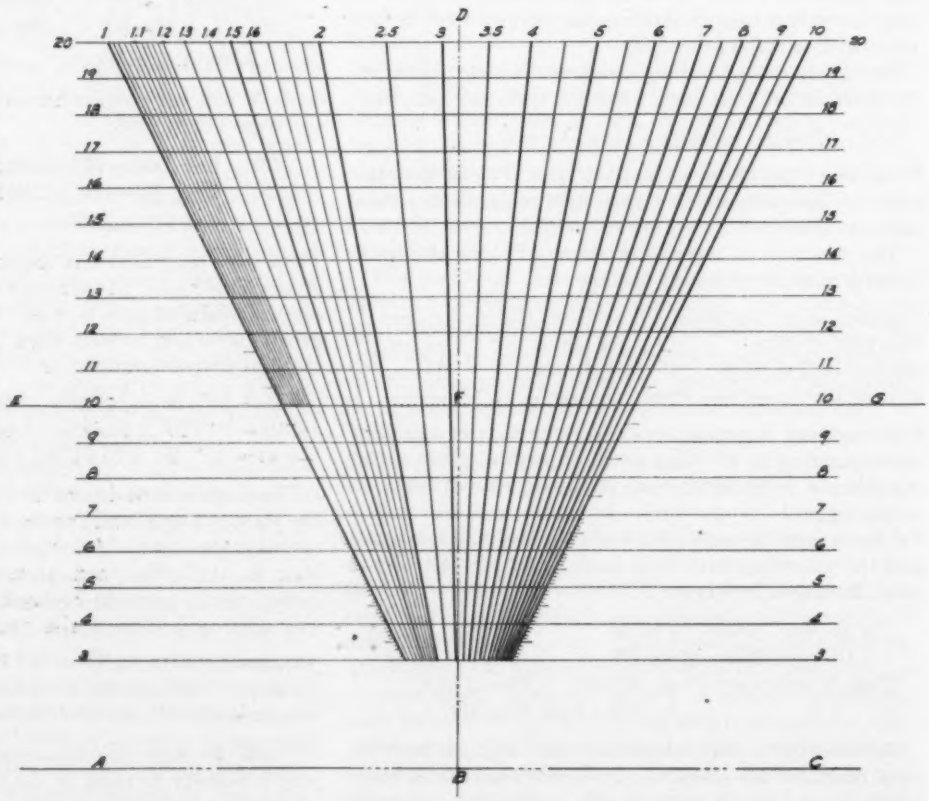


Fig 3.

any range of numbers if the values on the scales are multiplied by the proper power of 10.

For scales with moduli greater than 20 inches, say 25 inches, which is beyond the range of the chart, use the chart folded at the 12½-inch line and double the length of the scale divisions by means of dividers. Scales for other moduli are constructed similarly.

The scales for the rule should be drawn on a fine smooth grade of bond paper. Care should be taken to keep the division lines as fine as it is possible to ink them and still render them clearly readable. The division marks should follow the pattern of a standard slide rule closely, the longest division lines, i. e., those defining whole units on the scale should not exceed 3/16 inch in length. The lines for intermediate units should not be longer than ⅛ inch, and the shortest lines for minor units should not exceed 1/16 inch.

After the scales are inked, they may be carefully cut out and glued to the rule blank in their proper sequence. An old safety razor blade does the best job of cutting the scales out. After the scales are fixed in place, a trial calculation will serve to locate the position of the index arrow which is then drawn in place on the rule.

When the rule is complete, a coat of shellac or spar varnish over the paper scales will preserve them and prevent their becoming so soiled as to be unreadable.

Figure 1, as shown indicates that when laboratory analysis and tests show that the bleach demand of a certain pulp is 15 per cent of bleach expressed in terms of 35 per cent bleach, and the concentration of the liquor is 20 grams of chlorine per liter, then 629 gallons of the liquor are required per ton of stock to be bleached.

In the December, 1936, issue of THE PAPER INDUSTRY, the author presented a method of making a sulphite acid slide rule. The methods outlined in that article are exactly the same as are used in the making of this rule except that in this case the scales are logarithmic rather than uniform.

Anti-Friction Bearing Comments

C. B. SAWYER

ONE of the most interesting modern developments in paper mill machinery has been the steadily increasing use of anti-friction bearings. These applications run the gamut from the light ball bearings for table rolls to the very heavy duty roller bearings for pulp grinders and calender stacks. Jordan engines offer one of the most satisfactory applications.

Older designs of Jordans were belt driven and had babbitted bearings. The pulley end of such Jordans carried only a radial load—the pull of the belt and the load of the shaft and the small end of the plug. This weight was distributed between two bearings. The front end bearing had to carry a thrust load as well as a radial load caused by the weight of the large end of the plug.

The thrust load was handled by a combination of six or seven shoulders, or collars, on the shaft fitting into recessed babbitted portions of the bearing. The bearing, grease lubricated through a cup located on top of it, usually needed to be cooled by a steady stream of cooling water fed over the outside through a small hose. A water-jacketed front bearing was incorporated into the Jordan designs of some manufacturers.

The slightest radial wear in the Jordan bearings threw the plug out of center with the shell, thus bringing the knives of the plug and shell in contact on one side and creating too great a clearance between them on the other. Fiber treated in a Jordan in this condition was uneven and resulted in a poorer grade of stock. Likewise considerable power loss was caused by the friction between plug and shell, and frequent refillings were necessary.

Many of the first motor driven, direct-connected Jordans were old Jordans changed over from belt drives. These units soon revealed heavier thrust loads than in the case of the belt driven machines. It appeared evident that the belts had absorbed some of the end thrust as the motor driven units showed additional wear and required more frequent re-babbitting. These difficulties have since been eliminated through the use of the proper type of roller bearings.

Straight roller radial and thrust bearings are recommended for this service. This combination allows radial and thrust loads to be applied at right angles to the rollers and provides for maximum load capacity. The sole function of the radial bearings is to carry the weight of the plug and to center it in the shell. The thrust bearing handles only the thrust load and is made to care for thrust in either direction.

The back end bearing is of somewhat different design. It is not subject to end thrust except such as is required to move the housing back and forth along the shoe as the plug is adjusted in the shell.

Roller bearings can usually be applied to any Jordan which has babbitted bearings with no change or machine work except turning down the shaft to receive the front bearing. Likewise, roller bearings with straight rollers are being used more and more by paper mills and paper machinery builders for applications which require heavy duty capacity for radial loads. Among these latter applications are bearings for calendar rolls, pulp grinders, heavy press rolls, chippers, and dryers.

With the straight roller type of bearing, expansion and contraction under conditions such as prevail around paper machine dryers, are taken care of by a lateral rolling contact between the rollers and races instead of sliding the bearing in the housing or the housing in its frame. The bearing at one end is fixed while the other end is free to move with this internal rolling contact.

This construction also is of advantage for press roll and calender roll bearings—applications where rolls must be removed at fairly close intervals. In such applications, the inner races remain upon the journals while the outer races and rollers slide off.

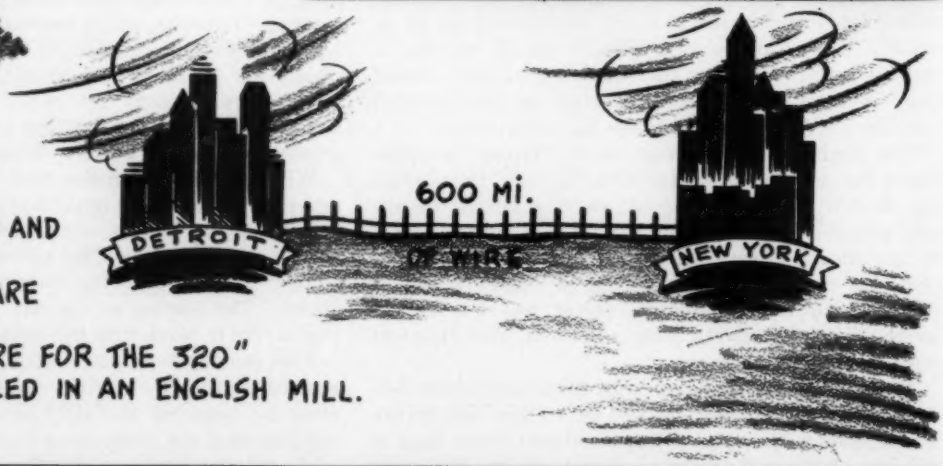
Paper Sketches---

THE FIRST PAPER MONEY EVER USED SEEMS TO HAVE BEEN THE WRITTEN RECEIPTS, ISSUED ABOUT 807 A.D. IN CHINA BY THE EMPEROR HSIEN TSUNG. EACH RECEIPT, SEALED WITH THE IMPERIAL SIGNET WAS IDENTIFIABLE BY MATCHING ITS TORN EDGE WITH THE TORN EDGE OF A CORRESPONDING STUB KEPT AT THE IMPERIAL TREASURY.

SO SUPERIOR TO PAPYRUS WAS PAPER CONSIDERED BY THE EGYPTIANS OF THE 9TH CENTURY, THAT ON ONE OCCASION A CORRESPONDENT, FORCED TO USE PAPYRUS FOR A LETTER CLOSED HIS MESSAGE WITH THE WORDS, "PARDON THE PAPYRUS."

ALTHOUGH THEIR TOTAL OUTPUT WAS ONLY ABOUT 50 TONS A DAY, THE WRITING PAPER MANUFACTURERS, IN 1860, HELD A MEETING AT PITTSFIELD, MASSACHUSETTS, TO CONSIDER THE PROBLEM OF OVER-PRODUCTION.

SIX HUNDRED MILES OF WIRE, A LITTLE LESS THAN 340 FOR THE WARP AND MORE THAN 261 FOR THE SHUTE, ARE USED TO MAKE A FOURDRINIER WIRE FOR THE 320" MACHINE INSTALLED IN AN ENGLISH MILL.



Some Analyses of European Trade Conditions

THE following outline of conditions during 1936 and forecast for the coming year has been submitted for the three countries—Great Britain, Norway and Italy—by special contributors in those countries.

GREAT BRITAIN

When toward the end of 1931, Great Britain was faced with its financial crisis which led to the movement away from the Gold Standard, the dissolving of Parliament and the substitution of a National form of Government, trade throughout the country had reached the lowest level experienced during the long depression of the preceding eleven years. Naturally, in this, the paper trade suffered along with other industries and prices had been forced down gradually and continually until, in many cases, they practically had reached pre-war levels. The introduction of tariffs, a novelty for this country, coincided with the turn of the tide, and year by year trade gradually improved but the low prices remained constant amid intense competition. Printers and other paper consumers forced these prices down not only by competition but by the substitution of cheaper paper grades. During 1935, material costs, for the first time since 1920, disclosed a tendency to advance, but the year proved the best on record since the end of the trade depression.

The year 1936, as usual, opened on an optimistic note, everything pointed in the direction of increased demand, but still the one chief factor, prices, remained immovable, although the previous year had witnessed an attempt, which met with partial success, among the wood free mills, to stabilize prices. Further, conventions were also in operation among the mills producing M. G. Posters and featherweight book papers, but always the few mills outside these conventions proved a source of possible disruption. At the same time, there was in negotiation a major convention covering the vast wrappings section of the trade both in this country and the Scandinavian interests, the latter known collectively as Scankraft, which included the making and marketing of wrapping papers, together with the control of the important paper bag section. This was eventually brought to fruition and has so far worked smoothly to the benefit of all concerned.

It was noted that trade improved month by month in comparison with the previous year, although, being adjacent to Europe, British trade is naturally influenced by political movements on the Continent. These have been particularly active during the present year, nevertheless, this progressive trade movement was maintained and that it was not confined to Great Britain was confirmed by the news received, early in the year, both from Europe and Canada together with the kraft improvements in the U. S. A. Quite early in the year, material prices made a definite and determined upward movement and this applied not only to all grades of pulp but many of the incidental papermaking materials. At the same time, sales of all qualities of papers continued to advance, and these two factors led to the expectation of an early rise in selling prices.

Paper Production

Complete confirmation of the greater consumption was to be found in the monthly returns, published by the Board of Trade. From January to October, the imports of papermaking materials advanced by no less than 200,000 tons in comparison with the same period of the previous year; and for the first three quarters of the year, the imports of manufactured papers and boards reached 866,595 tons against 783,843 tons, although these were mainly confined to newsprint, wrappings and strawboards.

To cope with this increased trade and to make provision for anticipated further increases, sure and steady progress in the way of improvements has been made at a number of mills during the year. In several cases, new and additional machines have been laid down. John Dickinson and Co., at its Croxley mill, has installed a further wide machine for fine papers and an additional machine for high grade watermarked papers. Albert E. Reed, whose plant already possesses the largest M. G. machine in the world, has added two more machines in order to keep pace with the greater demand for wrapping papers. The extraordinary progress in the wrapping and boxing of foodstuffs and other articles has proved one of the most spectacular movements in the trade during the past few years. This year, one comparatively new mill installed its fifth machine and now contemplates another. The Thames Board Mill with several boxboard machines at Purfleet, one of which alone has an output of no less than 250 tons per week, has extended its activities with an entirely new mill which, when completed, will house two modern machines.

Progress of the Mills

Perhaps the most interesting item of the year is the re-entry of William Harrison into the paper trade. It will be recalled that Mr. Harrison was the prime mover, some fifteen years ago, in organizing the Inveresk group of paper mills, which embraces several of the largest esparto and coating mills in Great Britain. Mr. Harrison, on this occasion, has turned his attention to Wales where, at Cardiff, he has re-organized the mill belonging to Messrs. Thomas Owen and Co., with the idea of concentrating on the production of glassine, vegetable parchment and esparto papers. The improvements include the installation of the most up-to-date parchmentizing machine in the world. Alongside this mill, a coating factory is being erected which will eventually house twelve machines having an output of over 100 tons per week. The present plans also include a large estate for the purpose of building houses for the workers. Such industrial effort is particularly welcome to Wales, for this part of the country has been most heavily hit by the trade depression. Transparent cellulose is another section showing great activity and despite heavily increased output a further factory is being erected, at Bridgewater, by British Cellophane, which is controlled by Courtaulds, Ltd. when completed, this factory will be the largest viscose paper works in the country. Yet, at the same time, this section is being hit by Japanese competition which is undercutting the market seriously, so much so, that application has been made for an increased duty.

This steady progress in the trade and its generally healthy conditions were reflected in the company reports as they came to hand. Those of the early part of the year naturally covered 1935; but later reports, which included the first part of 1936, continued the general trend of maintained, or, in a number of cases, improved profits, similarly interim reports supported this tendency. The vast firm of Wiggins Teape and Alex. Pirie disclosed an increased dividend down to the nine months January to September, and the Clyde Paper Co., manufacturing coated papers and news print, doubled their ordinary dividends. Inveresk reported £10,000 increase for 1935, and similar reports were received from many other directions. The money market was busy and the many new issues were snapped up within a few hours. British Clays Lovering Pochin and Co., Ltd., opened the year with an issue of £400,000 5½ per cent Cumulative First Preference shares at £1 each and Bowater's Mersey Paper Mills doubled their capital by the issue of a million £1 shares. Messrs. Kellner-Partington Paper Pulp Co., Ltd., who, incidentally, own all the shares in the Waterfalls Paper Mills, Maine, issued £1,100,000 4½ per cent Guaranteed Mortgage Debenture Stock. Messrs. Albert E. Reed proposed to increase their capital from £1,000,000 to £1,600,000.

Newsprint Section

The governing factor, as regards prices in the paper trade, is naturally

the position of the newsprint section, and, in this respect, the British Paper Makers are in a peculiarly disadvantageous position for this is the only grade of paper entering this country upon which a duty is not imposed. Considering that many millions of pounds have been expended on these mills during the past decade or so, this is a severe handicap to the receipt of an adequate return for their efforts. About a third of the newsprint consumed in Great Britain is imported and of these imports approximately one-third arrives from Europe. Although this is small proportion, its free entry has caused newsprint manufacturers to make strong representations to Parliament.

Early in the year it was seen that the world demand for newsprint was increasing steadily and a substantial price increase was expected, but it was appreciated that the Hearst contract might dominate this. Meanwhile Canadian output advanced month by month until by September it had risen by 323,988 tons. At the same time, Russia was aiming at increased tonnage and the Chinese were contemplating an initial newsprint mill at Wenshow, with an output of 12,000 tons per year. Just after the middle of the year, a surprise was sprung on the British trade by the fusion of the Edward Lloyd and Bowater interests, the two leading manufacturers of newsprint in this country. The sum of £5,000,000 was involved and an annual output of 500,000 tons.

Paper Prices

Returning to the subject of paper prices, in other sections of the trade attention was drawn, early in the year, both to the scarcity of wood pulp and the increased demand. Prices moved with determination and every class of pulp even down to mechanical wood was affected. At the same time America was buying in large quantities and the European Organization which controls the Sulphite Pulp Supplies agreed on a fixed total export covering 1936 to 1938. In October it was reported that all pulp supplies were sold for 1936 and nearly 1937 and offers for 1938 were being considered at the same time the pulp suppliers were experiencing their own difficulties in the way of increased costs. One timber sale disclosed a 50 per cent increase on the previous year and Sir Keith Price, head of the Wood Pulp Association in Great Britain, predicted immediate increases. Actually kraft papers have experienced four advances, of 10/-per ton (2240 lb.) each, during the year and greaseproof has advanced substantially, but it was not until towards the end of the year, in October, that the other manufacturers made the first decided move towards increased prices, in the other sections. This was led by the Wood Free Mills with the general advance of £1-3-4 per ton. Esparto papers followed almost immediately, with the coated grades on its heels, and finally M. G. Posters. Meanwhile Scankraft, controlling the wrapping section, decided to continue its combination until the end of 1940.

The prospects for 1937 are decidedly good, for, with increased trade, not only through the usual channels but with the added fillip of the armaments race, in which Great Britain has at last entered, and its consequent increased employment will help to maintain many of the mills in their present position of having three to four weeks work in hand.

NORWAY

The year 1936 has been a very remarkable year for the pulp and paper industry. The development of the market and circumstances on the whole have kept pace with the development of the state of things in other countries of the world that are dependent on the pulp and paper industry. This industry is of international dimension and by degrees has grown more and more in this direction.

Even at the beginning of 1936 the market was, with few exceptions, rather depressed and the prices very low, and it was not at all easy to find a market for the production. To a great extent, restriction of production, therefore, had to take place, which was due partly to (1) the prices obtainable being found too low, and (2) because the demand was not in proportion to the supply. The crisis which arose several years ago was then still reigning.

In the course of the present year, a great alteration has entered into this state of affairs.

Wood Pulp

There has not been any great expansion in this industry during the present year. Some of the mills have extended their capacity by new and modernized machinery. On the other hand, a couple of small mills have been destroyed by fire.

Norway has been a large producer of wood pulp, particularly wet wood pulp. This was a very natural industry for Norway on account of the great surplus of water power that was available. This industry, therefore, soon became very important in the country and developed satisfactorily for a number of years. The figures of exported pulp kept up prominently for a number of years, but, since the crisis set in a few years ago, this industry has been suffering most of all. The prices were as bad as could be and the demand not at all up to the supply. A number of wood pulp mills, therefore, have become entangled in financial difficulties.

The restriction of production took place after certain lines were agreed upon by the most important wood pulp producing countries of Europe. This restriction of production has been necessary for several years on account of insufficient demand.

During 1936, this state of affairs was changed. Not only have prices gone up so that most mills can now work on a profitable basis, but at the time this is written the mills are working full capacity and it seems as if the supply cannot meet the demand. Therefore, it is expected that prices will rise still higher.

The exportation of wood pulp from this country has shown some increase the past months as compared with the corresponding months of 1935, which corroborates the satisfactory development of the market.

Sulphite Pulp

The market for sulphite pulp has developed very satisfactorily. At the beginning of the year, pulp for artificial silk was chiefly in good demand and good prices were paid. In the course of the year, the other kinds have been following suit, and at present the prices for all kinds of sulphite pulp may be said to be on a profitable basis for the mills. However, it may be mentioned that the mills are now very well sold ahead, some of them for the greater part of 1937, so that the rise in prices which has taken place of late will not benefit the mills.

No new mills were started during the year 1936, but considerable modernizing has taken place, also some extensions, so that the capacity of this industry, on the whole, may certainly be said to have increased.

Sulphate Pulp

The sulphate industry is not of any great interest to Norway, there being only a few mills here so that it cannot be compared with that of sulphite pulp as far as capacity is concerned.

The market for this product also has been quite satisfactory to the mills during this year. Sulphate pulp is in good demand and the prices are quite remunerative.

There has been some talk about a new sulphate pulp mill in the Skien district, but so far nothing has been decided. It is very likely, however, that the rumor is based on fact.

Paper

This industry is of great importance to Norway as rather large quantities are tured out. The most important product is newsprint.

The newsprint market has been in a deplorable state for years, prices having been so low that it has been impossible for the mills to make both ends meet. At the beginning of the year, the outlook was not at all bright, although the mills were then able to run full time. In the course of the year, however, the newsprint market has become stronger, and particularly during the fall season the prices improved so much that they may now be said to have reached a remunerative basis. It should be stated in this connection, however, that newsprint is sold on long contracts so that the prices now obtainable will not come into effect right away, but the outlook is very much better.

At one time England was the greatest consumer of Norwegian newsprint. This is no longer the case as it seems that South America is about to become the largest consumer of Norwegian newsprint. Argentina, particularly, is an important market.

Prices for other kinds of paper, on the whole, have been firm and have been raised from time to time.

Better class paper had a weak market at the beginning of the year, but the market for this class of paper is now better.

In regard to new machinery, it may be mentioned that Union Co. has installed a new machine in its newsprint mill at Skotfos.

In the course of the summer, two large newsprint machines at the Follum Træsliberi near Hönefoss were destroyed by fire and will not be in working order for a long time. The sulphite mill belonging to the same concern has been kept in operation.

Boards

The market for boards has shown a great variation during the year of 1936. At one time there was such a shortage of orders that it was necessary to restrict production considerably, but this product also shows improvement of late, and, although the year has not been very profitable for the mills, the outlook at any rate is very much brighter.

Résumé

On the whole, the feeling of better outlook for the wood pulp and paper industry is making itself felt, and it seems as if this betterment of the market is well founded being due partly to increased consumption and to a better demand.

The labor question gave rise to quite some uneasiness during this year. Negotiations between the two parties seemed to lead to no result for a time and it was expected that a shutdown of the mills was unavoidable, but finally a settlement was arrived at and the country was spared a conflict between the millowners and the laborers.

Finally, it may be mentioned that wood, the raw material upon which the wood pulp and paper industry is founded, has become higher priced. The price for wood has kept rather stationary for some years, but the prices that have been paid for deliveries to take place next spring show an increase.

ITALY

The Italian paper industry faced many difficulties during 1936. These were successfully overcome, however, and many of the producers feel their position so strengthened that they look forward to 1937 with optimism. Better conditions are foreseen, permitting expansion in some branches. The consumption of paper is expected to reach a higher figure and the industry is less handicapped for supplies of raw material than in preceding years.

The Difficulties of 1936

The past year brought unfavorable conditions for all Italian industries, especially for the producers of paper, since the unsettled conditions in other countries reduced exports and increased imports. This situation affected the Italian commercial balance and consequently caused a more rapid exodus of gold. Then, too, there was not sufficient employment for the increasing population. This drew attention to the colonies in Africa and caused a war with Abyssinia. The Italian government, therefore, faced an enormous financial deficit and was compelled to make a claim on the patriotism of the people. A generous response resulted. Gold, jewelry, iron and other metals of all kinds valued at more than a billion dollars were sacrificed willingly by all classes. A great factor in this favorable situation was the application of the sanctions imposed by the Society of Nations.

Later, an exaggeration of the dangers created by such sanctions and the thought of ruin facing the country brought the people to their toes. The rapidity with which exportations and importations were reduced with many nations and almost suspended within a few weeks consolidated its position in the world instead of doing it any harm. All useless or cumbersome stocks were eliminated, new raw materials were created and electricity largely replaced other combustibles. The exodus of gold was stopped through the enforcement of "Clearings" and other important dispositions. For the above reasons, 1936 will be remembered in history as the most eventful year for Italy since 1870.

Many new laws were enacted to regulate the trade with countries that still wanted to do business with Italy under conditions that the value of the lira could be left unchanged until the elimination of the sanctions when the dollar was brought back to the former quotation of 19 lira. This arrangement was the result of reduced deposits of gold with the Bank of Italy created by sudden large payments abroad.

As soon as the above change had been introduced, the Italian government lowered the entrance customs of many raw materials and products by abolishing the ad valorem tax and by modifying favorably other entrance customs. In this way, although the value of the lira had fallen off a good thirty per cent and more, the domestic situation was not much modified, especially as the wages and salaries of all employees were increased from eight to ten per cent, and a rise in rents was prohibited for a period of two years.

Besides the above, the Fascist Party introduced other modifications. New Commercial Accords were settled with abroad, through which most importations were reduced to percentages of what was received in 1934. Later, however, a certain increase was allowed in the importations of raw materials and of certain finished goods when these could be covered by exports of Italian products of like value. Later, this concession was abolished and new arrangements made, noteworthy of these being the two "Accords" settled in Rome between England and Italy on November 6. This permitted reinstatement of trade between the two countries on November 16 after an interruption of nearly a year. Old Italian debts were paid off by allowing the values of Italian exportations to exceed the value of the imports from England by ten per cent. Later, Italian imports will be continued in accordance with the values of exportations.

The above state of affairs resulted in the restriction of supplies of foreign cellulose and paper, and serious difficulties would have followed if the Government had not issued a decree reducing the number of pages in all publications and restricting the issuance of any new journals. Shops were required to use less paper for packing and often the buyer of foodstuffs and merchandise had to supply old paper for this purpose. After conditions became more favorable and more supplies were received from abroad, these restrictions were partly withdrawn.

In November, 1936, most paper mills were affected by a progressive tax on the dividends of all commercial firms. Besides this, the imports received between October 5 and October 20 were valued in lire at the old price but the value of payment for customs was raised as follows: 25 per cent increase from France and Czechoslovakia, 50 per cent from Finland, and 45 per cent from other countries.

The strong demand of the mills making supplies for Italian East Africa was a new factor which contributed toward keeping up the production of several qualities of paper. Therefore, the different mills in 1936 were not far from the 500,000 tons of 1935 despite the great scarcity of raw material and the low production of cellulose in Italy. From 1900 to 1935, Italy had forged ahead in the production of paper by increasing from 100,000 tons to 500,000 tons.

The National Corporation for Cellulose and Paper opposed the action of the sanctions and took advantage of the Milas and Bari Industrial Fairs to offer a prize of 20,000 lire ($1,052) for a remedy to eradicate the disease that has impaired the poplar tree, an important source of raw material in Italy. The fair offered an interesting and instructive exhibit of raw materials, paper, cardboard and rayon.

In Italy, the consumption of paper per person is very limited as compared to other nations. Italy consumes not more than an average of 10 kilos of paper per person against 100 kilos per person in the United States, 40 kilos in England and 20 kilos in France.

Developments in Producing Cellulose

The past year witnessed a major step toward emancipation in the supplies of cellulose. This is very important, as in 1935 about 300,000 tons of cellulose were imported. One-third of this amount was used in the textile industry and two-thirds in the production of paper. During the same year, the Italian production of cellulose was 12,000 tons, or only four per cent of the amount needed by the country. In the first nine months of 1936, a similar tonnage was produced and it is expected that the tonnage for the entire year will reach 20,000 tons. It seems certain that 1937 will show an increase because of the new plant of Foggia for producing cellulose from cereal straw. It is believed that the production for the current year will reach a total of about 30,000 tons.

Engineer Pomilio has obtained good cellulose from cereal straw (rice, rye, oats), linen and hemp, by using water, salt and electric energy. It was demonstrated at the Bari Fair of 1936 that for making one ton of cellulose, the following were needed: About 2½ tons of fibrous raw material; 650 kilos (1,430 lb.) of salt, and 100 kilos (220 lb.) of lime. The energy and necessary labor were proportional to the size of the plant. The Pomilio Cellulose Syndicate has estimated that a plant with a capacity of 6 tons per 24 hours requires 12 operatives for each working day, and that such a plant would cost 1,200,000 lire ($63,157) or 200,000 lire ($10,527) per ton.

There are at present four cellulose producing plants in Italy. The latest one is near the town of Foggia and is composed of 10 large buildings. This plant is of some importance and pulps exclusively domestic raw materials through the use of chlorine gas. The yearly production capacity is 10,000 tons of cellulose and 7,000 tons of paper, which may be doubled later. Various types of paper, comprising fine, letter, register and packing papers, are manufactured using about 75 per cent straw cellulose. The Foggia plant began operation last June with several hundred workers.

Italian industrialists are looking toward the installation of other cellulose producing plants, while processes are being studied that will permit the replacement of cellulose with other products.

Other Sources of Raw Material

So far, the poplar tree has been the principal wood used by Italian paper mills for making pulp and cellulose. This choice is due partly to the excellent fibers obtained from this wood and partly to the fact that the tree grows within a relatively short time. In 1936, the demand for small poplar trees for replanting became so heavy that it surpassed the stand of year-old trees. For this reason, many of the requests will only be satisfied in 1937 when the National Corporation for Cellulose and Paper will have stronger supplies coming from five growing zones of Ferrara, Villa Literna, Bovine, Colico and Borgo Val Travaglia.

Some effort was made for extending the use of pine wood for producing pulp and cellulose as the tree grows easily in many Italian regions. The fir tree was used for papermaking in the works at Mantova and Tolmezzo, while the paper mills of Burgo, at Romagnano Sesia, continued experimental investigations for the production of paper pulp, cellulose, cardboard and box material from tobacco stems. Besides this, the possibility of producing cellulose from the wastes of chestnut and beechwood left from the production of tanning extracts was considered.

Toward the end of 1935, the Bank of Sicily negotiated plans for erecting in Sicily plants for producing cellulose from the broom (furze) plant. This had been tried before but was not successful because of lack of financial support. However, owing to changed conditions, it is expected this development will be more successful in 1937.

During the latter half of 1936, in the province of Massina, considerable work was done in the production of cloth and cellulose from the broom plant. In accordance with the most recent and accurate experiments, 1/10th ton of broom plant yields from 10 to 15 kilos (22 to 33 lb.) of fibers, and from the materials that remain after the extraction of the textile fiber, a considerable quantity of cellulose can be prepared. Some important works have already started the use of this material and obtained satisfactory results. This plant is very plentiful. It is to be found in nearly every region of Sicily and in several parts of continental Italy. Sicily is considered in a position to furnish other useful papermaking raw materials. Italian East Africa also is expected to furnish such raw materials as china grass (ramie), linen and other important raw materials.

Professor Giordano has traced the plan of action for the Italian paper industry as follows: Maintain the production of fir tree cellulose with bisulphite by adding to the two existing works bleaching plants; proceed immediately to promote the use of chestnut wood wastes, straw from rice cultivations of Vercelli and fiber from the corn of Puglia. If this is done, 30,000 tons of white cellulose and mechanical pulp for paper can be produced in less than one year.

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◆ New Colored Newsprint

A new advertising sensation, a revolutionary forward step in the use of color in newspaper advertising, was revealed on December 9, when a large local department store, The Dayton Company, published in *The Minneapolis Journal* two pages of color advertising in which no color plates were used.

This achievement was made possible by the use, as regular run paper, of a new newsprint in which the color is manufactured in the paper itself, thus permitting the roll to be handled in the press room just like ordinary white newsprint.

The method was conceived by Carl W. Jones, publisher of the Journal, who, with Journal technicians and the Blandin Paper Company of Grand Rapids, Minnesota, conducted the experiments which made it possible for the Journal to become the first newspaper in America to offer this distinctive new color service to its advertisers.

"This new newsprint is revolutionary because it enables advertisers to use color without color plates, in any daily newspaper in America, whether they print color or not," said Mr. Jones. "The new color newsprint comes in any size page or roll to meet the specifications of any size press requirements. There are no 'bugs' in it to be ironed out. It is perfected now for immediate use.

"Selection of colors or design of color is left entirely to the specifications of the advertiser," Mr. Jones said. "As many colors as wanted can be used on a single page. Text and illustrations can be printed in black without the expense for color plates. Its real significance may be summed up in the fact that it makes color advertising practicable and economical, by eliminating both color plates and inserting."

Mr. Jones pointed out that The Minneapolis Journal does not offer this new method as a substitute for color-plate printing, but as a quick, cheap and remarkably effective complement to it. He sees in it a sensational new method by which advertisers, both national and local, may capture the attention of the buying public.

◆ Mrs. George H. Spencer

Mrs. George H. Spencer, wife of George H. Spencer, general manager of E. D. Jones & Sons Company, Pittsfield, Mass., passed away on December 8. Upon returning home from Christmas shopping and but a short distance from her home in Pittsfield, Mrs. Spencer lost control of her automobile, in which she was alone, and crashed into a tree, sustaining fatal injuries.

But thirty-one years of age, Mrs. Spencer leaves her husband and two sons, George H. Jr., and William; her mother, and a brother, Edward Theurkauf of Montclair, N. J.

The many friends of Mr. Spencer's, in the paper industry, extend their deep, heartfelt sorrow to him, in his sad bereavement.

◆ Expansion Voted by Rhinelander

It is reported that Rhinelander Paper Company, Rhinelander, Wisconsin, has plans for expansion which call for an addition to the present mill and will include the installation of an additional paper machine. When the new unit is completed, it will increase the working force by about 30 employees.

At the end of the year, the directors voted a dividend of 1½ per cent to stockholders, which was in addition to a former dividend of 2 per cent. The employees were given a bonus equal to 3 per cent of wages earned during the year.

◆ Rufus L. Sisson

Rufus L. Sisson, treasurer of the Racquette River Paper Company, Potsdam, N. Y., passed away December 30 at his home in Potsdam. He was 76 years of age.

Mr. Sisson had been associated with the lumber and paper industries all his lifetime. He was a prominent figure in the state and local affairs.

Surviving are his widow and a daughter and three sons. The sons are all connected with the Racquette River Paper Company—Rufus L., Jr., sales manager; Walter C., assistant treasurer; and Lewis H., Western sales representative.

That Matter of Vacations

E. M. GROUT
Personnel Department
Bird & Son, Inc.

Many industrial organizations have adopted a plan providing vacations for all employees, including hourly wage earners. It is believed that many paper mills not now having such a plan will be interested in this article, which explains the vacation policy in effect in the mills of Bird & Son, Inc., East Walpole, Mass.

SOMEONE has said that a man can do a year's work better in fifty weeks than he can in fifty-two weeks. Certainly it is true that a vacation period of one or two weeks is a fine tonic for any worker—one that gives him the necessary relaxation and change of environment which fit him to do better work when he returns to his job.

With this idea in mind, Bird & Son, Inc., recently announced a new vacation policy effective January 1, 1937. This plan provides for a one-week vacation to all hourly wage earners having a continuous service record of two years or more. Such workers with a continuous service record of five years or more, are allowed two weeks. Salaried workers will continue to receive their customary two weeks.

Since 1934, Bird & Son, Inc., has had a vacation plan for wage earners. That early plan was one of the first established among New England manufacturers and provided for a week's vacation with pay to all hourly paid workers with a continuous service record of ten years or more. The new, more liberal plan now extends the vacation privilege to more than 85 per cent of the entire working force.

In establishing this new plan, the management considered the benefits not only from the company's standpoint and the physical and mental welfare of the workers, but it took the position that every faithful mill worker is entitled to a vacation with pay quite as much as any office worker. Among the company's 1,600 wage earners are: papermakers, paper-box makers, highly skilled operators of roofing and flooring machinery, machinists, mechanics, electricians, engineers, fireman and scores of other loyal, industrious workers who have given the best years of their lives to the organization. There is no question but that they deserve the vacation privilege fully as much as office workers.

The company will reap its reward in a healthier and happier working force. During the annual vacation period these employees will be able to forget their jobs completely; they will return to work improved both physically and mentally and tackle the job with renewed enthusiasm. By these liberal provisions, it is obvious to the workers that they have not been forgotten and that their efforts are appreciated. Thus the company has earned the good-will of the employees and the community.

Because of the varied operations of the Bird & Son plants, the plan presents many difficulties. In East Walpole are the box shops and the paper machines making solid and corrugated fiber cases, shoe cartons, and a variety of special papers. In Norwood is a large floor covering plant supplying felt base products to the entire country. Also in Norwood and in Chicago are roofing plants, producing a wide line of asphalt shingles and sidings; and in Phillipsdale, Rhode Island, is a felt mill supplying rolls of untreated felt to the plants which use it. Anyone who is familiar with any of these lines of business can well understand the complexities involved when all of these lines are combined in one organization and an attempt is made to carry through a vacation plan which will be satisfactory to all and which will not interfere with manufacturing operations. The problem has been met successfully for many years under the old vacation plan, and the management is confident that with proper co-operation it can be carried through successfully under the new scheme. Vacations may be taken at any time throughout the year. They are not allowed to accumulate but must be completed within the year. Each foreman will make his own arrangements for the workers under him, planning the vacations so that those with the longest service records have first choice in vacation dates, and arranging his entire vacation schedule so that it will not interfere with the operations of his department. As in the past, it will be necessary in some of the large departments, to hire temporary employees during the busiest periods, which usually occur in the spring and summer months. This is an expense, but Bird & Son consider it a necessary and justifiable one. Most of the difficulties of the plan undoubtedly will be encountered during its first year of operation, and by 1938 the company will know the shortcomings of the plan and take steps to correct them.

In announcing the new policy, Benjamin H. Roberts, president of Bird & Son, Inc., made the following statement:

"It has always been our policy to provide the very best working conditions, and this company has been among the first in practically every movement to provide the increased benefits to employees. We feel that the change in the vacation regulations is in line with our previous policy.

"Due to the diversity of our business, it will be necessary to work out these vacation periods throughout the various departments and plants in a flexible manner, and necessarily the time of the year when the vacations can be taken must be left to the discretion of the management and may differ from department to department, and from plant to plant.

"We will need the utmost co-operation of all employees in order to work out this vacation policy, and we know from the co-operation which has always been received that this vacation policy can be put into effect in a manner which will be successful to all of us. It may be that quite a number of individual employees will not receive their vacations at just the time that they would like to take it, but we are sure that all employees will realize that this must necessarily occur in working out such a policy, and it is hoped that the operation of the plan will be smoother with each succeeding year.

"All employees will realize that the successful continuation of a policy of this kind must necessarily depend upon the financial success of this business, and we hope that the co-operation which is obtained from all employees will enable us to keep this plan in operation effectively."

◆ IT IS REPORTED that the Coos Bay Pulp Corporation's plant at Empire, Oregon, will be reopened soon. The plant has been down since early November because all available warehouse space was filled with pulp scheduled for shipment to the Orient.

◆ Shartle Wins Suit Against Centrap

Shartle Brothers Machine Company, Middletown, Ohio, recently won a final court decision in a litigation against their Centrap. Since this decision was rendered by the Supreme Court, their patent rights are now definitely and permanently established.

The history of this case goes back several years when Centrifugal Engineers & Patents Company brought suit against Shartle Brothers for infringement of the Thomassen patent owned by that company. The suit was tried in the first court and the decision was given against Shartle Brothers. This ruling was taken to the Court of Appeals who reversed the decision. Centrifugal Engineers & Patents Company then took the case to the Supreme Court, who sustained the decision of the Court of Appeals.

◆ ALLIS-CHALMERS MANUFACTURING CO., Milwaukee, Wis., announces that its subsidiary, Condit Electrical Manufacturing Corporation, Boston, Mass., is now being operated as a company unit. The plant is known as Allis-Chalmers Manufacturing Company-Condit Works, and is located at 1344 Hyde Park Avenue, Boston, Mass.

This multi-cylinder paper machine in use at the plant of Hummel & Downing Company, Milwaukee, Wisconsin, is 284 feet long. to take a one-view photograph. Instead, it was necessary to take 26 separate shots of the machine. These were pieced together

◆ Lawrence College Expands Chemical Laboratories

Lawrence College is undertaking a complete rehabilitation of its chemical laboratories with the purpose of providing modern laboratories on a par with those of any educational institution in the central West, according to an announcement made by the Kewaunee Manufacturing Company, Kewaunee, Wisconsin, who have been retained to provide new laboratory furniture and equipment throughout the department.

The program contemplates a complete modernization of the interior of the present quarters of the Department of Chemistry in the Stevenson Hall of Science, including floors, walls, ceilings, lighting, partition work, and the installation of thoroughly modern mechanical services which will provide every possible modern convenience to the laboratories.

The laboratory furniture and equipment throughout will embody the latest technological advances in the laboratory furniture industry, and has been designed with a view of securing for Lawrence College one of the best equipped groups of chemical laboratories available in the educational field.

A qualitative and general organic laboratory, a quantitative and physical chemistry laboratory and an organic chemistry laboratory are included, as well as completely modern stock departments, private laboratories, dark room, preparation rooms, balance rooms, reception lobby, and a very attractive and well equipped lecture room.

The national interest which has been aroused by the accomplishments of the Institute of Paper Chemistry, affiliated with Lawrence College, and the outstanding graduate and research work of the Institute have tended to make Lawrence a center for chemical education, and the new laboratories in the Stevenson Hall of Science, it is expected, will greatly further activity in this department of the College.

President-elect Thomas N. Barrows, who succeeds Dr. Henry M. Wriston as President of Lawrence College and Director of the Institute of Paper Chemistry, is manifesting the same keen interest in the development of the Institute as was shown by his predecessor, and he is actively identified with the movement to provide Lawrence College laboratories comparable in efficiency with the splendid laboratory facilities available at the Institute.

◆ Chas. C. Walden, Jr. Made President

Charles C. Walden, Jr., has been elected president and general manager, Walden, Sons & Mott, Inc., 41 Park Row, New York, publishers of "Paper & Paper Products," "Walden's A. B. C. Guide," "Printing Magazine," "The Paper Catalog," and "The Type Face Directory." Tom Walden, former treasurer, was elected chairman of the board and treasurer, and Stanton Mott, former secretary and assistant treasurer, was elected vice president and secretary.

Charles C. Walden, Jr., formerly vice president and general manager, succeeds his late father, Charles C. Walden, Sr., as president. The late Mr. Walden founded the firm in 1884, was its president until his death, July 14, 1936.

Mr. Walden, Jr., one-time mayor of Tenafly, N. J., has been in the printing and publishing business since he was a boy of 14. He has served on the board of trustees, New York Press Club, and as a member, Tenafly (N. J.) Borough Council. He is a director, National Graphic Arts Expositions, Inc., which conducted the exposition in New York in 1927. He is a member, New York Printers' Supply Salesmen's Guild, Graphic Arts Square Club of New York and many other trade and fraternal organizations. He is a resident of Stone Ridge, New York.

His brother, Tom, has been identified with the publishing business for several years. He is active in Ridgewood, N. J., Lodge of Elks, and Bergen County political circles.

Mr. Mott, 911 President street, Brooklyn, is secretary, board of directors, Berkeley Institute, Brooklyn.

◆ Robinson Made Vice President of Crane Ltd.

With the beginning of the new year, J. I. Robinson assumed the office of vice president of Crane Limited, Canada. He succeeded J. Austin Murphy, who has retired from active service after fifty-one years with the company.

Mr. Robinson joined Crane Co. in 1907 in the San Francisco branch. In 1919, when the company started its Canadian expansion, he was transferred to Montreal where he worked his way up to the position of Director and General Sales Manager. From this position he now steps up to the office of Vice President with complete supervision over Crane Limited and its subsidiaries.

◆ Paper Converting Ships Machine to England

Early in 1937 one of the leading manufacturers of paper in England will put on the English market, napkins made on a new machine which has been shipped to them by the Paper Converting Machine Company of Green Bay, Wisconsin. This machine is arranged to take two webs of paper, emboss them and print them in three colors. The machine was shipped from Milwaukee Nov. 15 on the steamer "Rutenfjell" direct to England. From the time the machine was loaded at Milwaukee until it was unloaded in England there was no transfer made.

This napkin quarterfolder is similar to those made by Paper Converting Machine Co. and installed in a number of converting plants in the United States. It has a capacity of 700 napkins per minute, all printed in three colors, embossed and folded.

The Paper Converting Machine Company has found it necessary to enlarge its plant and is building additions to the plant which will provide fifty per cent more floor space to the plant and increase the office space as well.

◆ New Plant Will Make Packing Filler

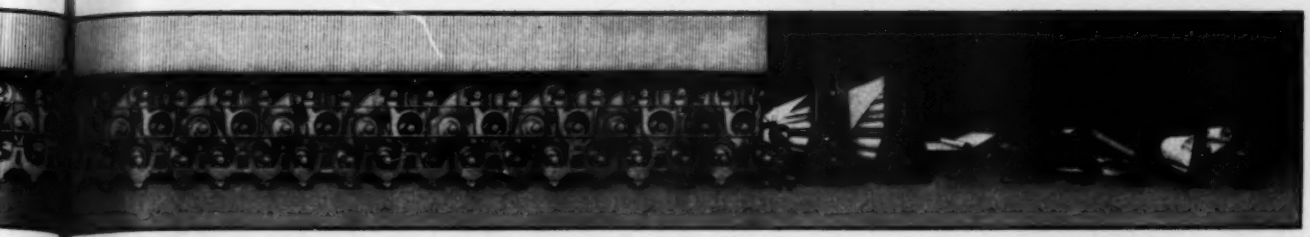
A plant is being built at Rochester, Mich., by The Colonial Paper Company, headed by Wm. Stronach, who has been operating a small plant in New Jersey. However, Rochester is his former home, as he was one of the founders of the Rochester Paper Company, manufacturer of blotting paper and was connected with that company for ten years.

The new company will manufacture a packing material which is a soft, cushion-like substance. It is to be about half an inch thick and will be made in one operation on a paper machine. It is not laminated and is not intended to be a substitute for corrugated board, but rather to be used with corrugated for packing purposes.

◆ Animal Stories and Pictures Wanted

H. H. Tryon, who may be addressed at The Black Rock Forest, Cornwall-on-Hudson, N. Y., has written the following self-explanatory letter to THE PAPER INDUSTRY.

"For a number of years I have been collecting the yarns dealing with the fearsome creatures of the lumber woods



The photographer who took this picture performed a difficult task, since on account of the location of the machine it was impossible in the negative in such a careful manner that the assembled picture gives the appearance of having been taken at one time.

which have so often been detailed by the old hands to the green men in the logging camps. It has always seemd to me that the life history and habits of such well-established varmints as the side-hill badger, the wampus cat, the tree-squeek, the cross-feathered snee and so on, are distinctly American folk lore and should be carefully preserved in some sort of written record.

"I can claim reasonable familiarity with a fair array of these animals, but I dont' know them all. It would help greatly if you could run this letter once or twice in your paper with the idea that some of your readers who are familiar with such interesting fauna would be kind enough to write me direct giving me as complete details as possible on the habits, the habitat and life history of any such parties with which they are familiar.

"Also any authentic photographs or drawings would be most welcome. These will be carefully copied and the originals returned safely to the lenders."

◆ Weyerhaeuser Announces Appointments

R. B. Wolf, manager of the pulp division of the Weyerhaeuser Timber Company, announces the appointment of L. K. Larson, as manager of sales for the division, with offices at 230 Park Avenue, New York City.

The New England Office under the direction of Henry F. Bigelow is located in the Bank Building, Clinton, Mass.

William A. Geiger and William M. McNair, with offices at 400 West Madison Street, Chicago, Ill., represent the pulp division in the middle western states.

◆ Special Goggles for Fire Lookouts

Special goggles for men in forest-fire watchtowers is far removed from the days when forest fires were fought bare-handed without organization or special equipment except the axe and the shovel, according to the New York State College of Forestry at Syracuse University. Great systems of fire towers connected by telephone, lookouts cooperating with airplane observers, automobile fire trucks, gasoline engines and hand pumps and a hundred special devices for putting out forest conflagrations are part of present-day forest fire-fighting equipment. The intensiveness of the present system is well illustrated by a United States Forest Service investigation of colored glasses for the fire detectors who man the watch towers.

In the states of Washington and Oregon it was found that 55 per cent of the fires started between one and 6:00 p. m. and that two-thirds of all fires discovered by lookouts are seen when looking toward the intense light of the sun. A few lookouts had used colored glasses with good results so the Forest Service determined to find out what kind of colored glasses were best for this purpose.

The result of these investigations were: First, that a neutral shade such as in smoke glasses is the best. This color reduces the amount of light reaching the eye but does not greatly change the natural colors of the landscape. Second, it was found that a glass transmitting 26 per cent of the visible light was best for the men in towers equipped with houses and shutter awnings. For lookouts occupying open towers or exposed to intense sunlight, glasses that transmit only twenty per cent of the light were found to be sufficient. Third, it was decided to adopt the so-called sport type pear shaped lenses, non-corroding metal frames, flexible and adjustable bows with a comfortable nose rest. Fourth, it was found that lenses in common colored glass might have one lense for far-sighted persons and the other for near-sighted persons and other imperfections which might result in eye fatigue. Hence, the need for providing the lookouts with a good glass optically finished to eliminate all distortion.

After all, state the college, what good is a fire tower lookout if his vision is obstructed, if the atmospherical or light conditions prevent the detection of fires when glasses can be provided at a small cost to remedy the situation? It is quite understandable that men in this service might be subject to eye strain on bright days when they are exerting a continuous effort to detect small tell-tale wisps of smoke that may rise on the far horizon at any moment announcing a forest fire.

◆ Testimonials to F. R. Hoadley

As evidence of the high regard in which he is held by those who worked with him, Franklin R. Hoadley, Vice President of Farrel-Birmingham Company, Inc., Ansonia, Conn., was presented with a beautiful silver plaque by the employees of the foundry and pattern departments.

The presentation was made during the noon hour on December 1st, when the men gathered in the Ansonia foundry for the occasion. Albert Dyson, chairman of the employees' committee, acted as spokesman and presented the plaque on behalf of the foundrymen and patternmakers.

On December 2nd Mr. Hoadley was tendered a testimonial dinner by the executive and office force of Farrel-Birmingham Company, Inc., at the Jockey Club in Milford, Conn. On this occasion Mr. Hoadley was presented with a handsome desk set as a farewell gift from his associates.

Mr. Hoadley has resigned as vice president of Farrel-Birmingham Company, Inc., to become president of the Atwood Machine Company, Stonington, Conn.

◆ Gair Acquires Container and Box Companies

The Robert Gair Company, Inc., has acquired the business, equipment, and inventory of the Pa Pro Company, of Utica, New York, and the Holyoke Fibre Box Company, Inc., of Holyoke, Massachusetts. The two corrugated shipping container units will be operated as the Pa Pro Containers Division and the Holyoke Fibre Box Division of Robert Gair Company, Inc.

◆ Malone Hill to Operate

All legal matters have been cleared and the reorganization of the Malone Paper Company, Malone, N. Y., have been sanctioned by the court. The mill will be operated under an incorporated company known as Malone Special Paper, Inc.

Some new equipment will be installed and the plant thoroughly reconditioned. George M. McKee, Jr., will be manager of the mill under the new organization.

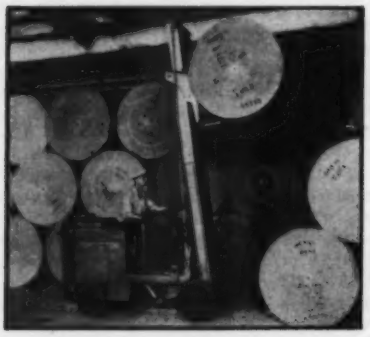
◆ Worthington Absorbs Associate Organization

On January 1, the Worthington Company, Incorporated, with offices in Seattle, San Francisco, Los Angeles and El Paso, was absorbed by its parent organization, Worthington Pump and Machinery Corporation, of Harrison, New Jersey.

This announcement follows that of December 28, covering the absorption by Worthington of its subsidiary, Carbondale Machine Corporation, builders of refrigeration, ice manufacturing and air conditioning equipment.

◆ Paper Handling Lift Truck

Towmotor, Inc., 1222 East 152nd Street, Cleveland, Ohio, has announced a new gas-powered, high-mast, lift truck for the handling and stacking of paper in rolls. This truck is equipped with a scoop, the forward edge of which, in operating it, is lowered to the floor with the mast tilted slightly forward and then forced partly under the roll being handled. A quick, backward tilting of the mast scoops the roll back into the



carriage where the roll holds itself in position without additional clamping.

Traveling is done with the load in the lowered position. The load is partially elevated upon approaching the pile, and when the truck has swung into position, it is lifted sufficiently to attain the desired height. Then a quick forward tilting of the mast puts the roll in place, the paper rolling off the scoop.

This truck, utilizing a hydraulic method of lifting and tilting, carries its load over the driving wheels. Rear wheel steering permits short pivot turn in close quarters.

The over-all height, the lift and the capacity of the truck may be governed to suit individual requirements.

◆ Electric Disc Sander

A ball bearing equipped electric disc sander, designated as No. 77, has been placed upon the market by the Stanley Electric Tool Division, The Stanley Works, New Britain, Conn. This sander, having a high speed motor enclosed in an aluminum alloy housing, is furnished complete with a 7" flexible pad, 12 sand-

ing discs (6 for metal and 6 for wood), wrenches and a rubber covered conductor cable. The tool, designed for use in close places, is suggested for cleaning rolls, for scouring tanks and vats, for removing paint and rust, for grinding heavy welds, for smoothing concrete and for numerous other production and repair jobs.

◆ Motor Mounted Brake

A totally enclosed, automatic solenoid brake for integral mounting with motor has been announced by Cutler-Hammer, Inc., 289 N. Twelfth St., Milwaukee, Wis. This brake is designed for application to either A.C. or D.C. motors in sizes from a fractional h.p. to 10 h.p. and for a motor speed of 3600 r.p.m. It can be supplied already mounted on any motor within the size range from the motor manufacturer.

◆ High Sensitivity Photo-Cell

A new, highly sensitive, self-generating photo-electric cell, designated by the trade name of "Electrocell," has been announced by Dr. F. Loewenberg, Mechanical Engineer, 10 East 40th Street, New York, distributor for the device in the United States.

The sensitivity of "Electrocell" elements is 480 micro-amperes per lumen. These elements come in a variety of

sizes—round shapes from ⅜" to 2⅝", and rectangular shapes up to 1½"x2". Such elements are claimed to be permanently stable and to have unlimited life. They are delivered either mounted in a Bakelite casing or unmounted.

The photo-cell is suggested for measuring glare and opacity of paper, for controlling thickness and moisture content of paper, and for matching colors.

◆ Two New Styles of Belt

Two new styles of Condor Compensated Belt, known as Style "F" and Style "B," have been developed by the Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., of Passaic, N. J.

Style "F" has a red friction pulley surface and is designed for use where a slight starting slip is desired, while Style "B" has a bareback untreated duck pulley surface and is built for conditions calling for a greater slip, or where slip is essential, as in the case of winder drives.

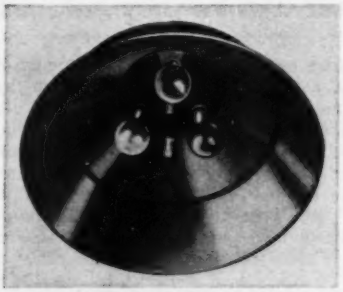
There are no differences between the construction of these belts and that of the regular Condor Compensated Low-Tension Belt except for the pulley surface.

◆ Combination Mercury-Mazda Lighting Unit

A combination 250-watt mercury-mazda lighting unit has been announced by the Westinghouse Electric and Manufacturing Company.

This unit, designed for mounting heights of 8 to 18 feet, uses two distinct circuits, one to control the mercury lamp and one to control the Mazda lamps. The design is such as to allow three 60-watt, three 75-watt or three 100-watt Mazda lamps to be used without interfering with the restarting of the mercury lamp in case of a voltage interruption.

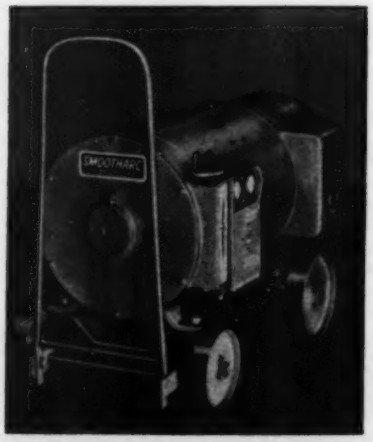
The entire socket assembly which consists of three medium sockets for the Mazda lamps and one socket for the mercury lamp is attached to the top of



an aluminum reflector. A slip type louvered cover provides ventilation for the sockets and allows for wiring or inspection of wiring after the reflector is in position. It is arranged for mounting on ½" conduit. A diffusing bowl is hinged in the reflector. This bowl provides for access to the lamps. Ventilation also is provided to keep the temperature within safe operating limits.

◆ Line of Simplified Welders

A new line of simplified welders has been placed on the market by The Harnischfeger Corporation, Milwaukee, Wis. These welders, designated as P & H Hansen "Smootharc," feature single current control, self-excitation and internal stabilization and are built as either ver-



tically or horizontally mounted units. The vertically mounted units are made in 75, 100 and 150 ampere capacities; while the units which are horizontally mounted are built in 200, 300, 400 and 600 ampere sizes.

Single current control is obtained through the use of shifting generator brushes of patented design. A set of auxiliary brushes placed ahead of the

main brushes and connected to an auxiliary shunt winding secures self-excitation; and the extension of the interpole winding to the main pole shoes in a manner that causes it to serve the dual function of interpole winding and stabilizing winding secures self-stabilization.

◆ Ozone Generator for Ventilation Ducts

The Electroaire Corporation, 1455 West Congress St., Chicago, has developed an ozone unit for attachment to any individual heating, ventilating or air conditioning duct. Air enters the unit at one end, is ozonated within it,

and is discharged from the end opposite the entrance. A rheostat and meter regulates the ozone generation.

This unit, designated as the JR Model, is made in three sizes with respective capacities of 3,000, 4,000, and 5,000 cubic feet per minute.

◆ Remote Control for Variable Speed Unit

The U. S. Electrical Motors, Inc., 200 East Slauson Ave., Los Angeles, Calif., has developed a new line of standardized parts for use with the U. S. Varidrive motor to obtain remote control of the variable speed unit. These parts include bearing supports, shafting, sprockets and chains.

◆ A New Dissolver

The Patterson Foundry & Machine Company, East Liverpool, Ohio, has announced a new dissolver for general dissolving of all kinds and for the dispersion of pigments. The machine, designed for handling a wide range of vis-

cosities and for internal working pressures up to 100 pounds per square inch, is obtainable in plain steel, stainless steel, aluminum and other metals. It is built in a wide range of sizes and in both plain and jacketed types.

◆ V-Belt Drives With Pivoted Motor Bases

The Rockwood Manufacturing Company, Indianapolis, Ind., has announced a complete line of V-belt sheaves and rubber V-belts for application on their pivoted motor bases. The pivoted motor bases maintain constant tension in the belts and permit the tension to be removed from them when the drives are not running. Bases are also furnished for use with existing V-belt drives.

◆ Sound Absorbent Phone Booth

A de luxe phone booth, designated as Model 202 booth and utilizing a sound absorbent lining instead of glass or wood panels, is the latest development of the Burgess Battery Company, Acoustic Division, 111 West Monroe St., Chicago, Ill.

This booth is constructed of steel and is furnished in three standard colors—gray, mahogany, brown, and flat white.

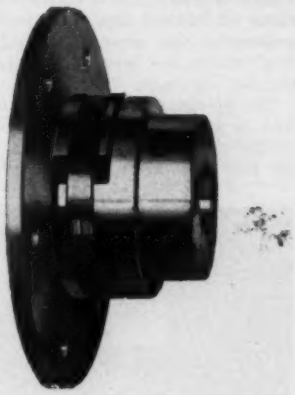
The interior wall finish is a warm cream color with white ceiling. A concealed ceiling light is provided with pull chain socket.

Over-all height is 85 inches. Width is 32 inches. Depth is 42½ inches.

It is open around the base, and due to the absorption of the lining, no door is required.

◆ Flexible Coupling of New Design

Lovejoy Tool Works, 4947 West Lake St., Chicago, Illinois, has brought out a new design of flexible coupling in which one of the bodies is made in the form of a flange and which can be bolted to flywheel clutch or brake drum. The coupling, referred to as an L-R Type WF coupling, will be made in sizes for bores from 3" to 14". A quickly removable outside retaining spring, as in the case of L-R Type W coupling already introduced holds free floating load cushions in place. These cushions, depending upon the service, are made of a long wearing brake lining material, of oak tanned leather, or of a rubber fabric that has been vulcanized under



high pressure. Such cushions are always in plain sight and can be removed and replaced in a few minutes without tearing down a coupling.

◆ High-Speed Close-Headroom Hoist

Electro Lift, Inc., 30 Church Street, New York, has announced a new high-speed, close-headroom, junior type hoist that is built in sizes of 250 lb. and 500 lb. and which has a hoisting speed of 60 ft. per minute. The hoist has a worm drive with worm and wheel running on Timken tapered roller bearings, fully enclosed within the gear case and operating in a bath of oil. The motor, equipped with ball bearings, is attached directly to the hoist frame. Control may be either rope type or push-button type.

The hoist is stated by the manufacturer to be particularly useful for the rapid handling of small loads in volume production.

◆ Box Car Loader

The Link-Belt Company, Chicago, Ill., has announced the development of a box car loader for the handling of bulk material, an anti-friction belt conveyor constituting the loading element of the machine. This conveyor, operated at comparatively slow speed and at a discharge height of 5 feet, is supported on a horizontal boom which, in turn, is mounted

on a truck equipped with four swiveling castors. Hand manipulation permits the boom to be rotated through 360 degrees on the truck, or to be racked back and forth. The swiveling castors permit movement of the machine from one location to another.

◆ Continuous Dual Arc Control Welder

The Lincoln Electric Company, Cleveland, Ohio, has announced a new line of single operator arc welders under the name of "Shield Arc SAE." This line supersedes the present type of "Shield Arc" which has been on the market for the last six years.

The predominating feature of the new line is a method of arc control which makes possible the adjustment of both arc heat and arc penetration in a con-

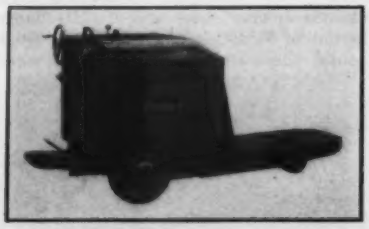
tinuous sequence of fine increments. It is claimed this continuous dual control assures absolute uniformity of performance at every control setting and adds greatly to the successful operation of arc welding.

Types and ratings for the new line are as follows: a-c. motor driven—200, 300, 400 and 600 amperes; d-c. motor driven—300, 400 and 600 amperes; generator for belt or couple service—200, 300, 400 and 600 amperes; and engine driven—200, 300 and 400 amperes.

◆ Gasoline-Powered Elevated Trucks

The Baker-Raulang Company, Cleveland, Ohio, has announced the production of a line of gasoline-powered elevating platform trucks in capacities of 3, 4, and 5 tons.

These trucks are equipped with a Hercules type IXB engine, with Electric-



Autolite starting and ignition equipment, and with a Zenith carburetor. Frames are of high carbon steel strongly riveted and arc welded. A single trailing axle is provided on the 3-ton truck, while dual trailing axles are used on the 4- and 5-ton units. Steering operates on all wheels and is actuated by a vertical handwheel.

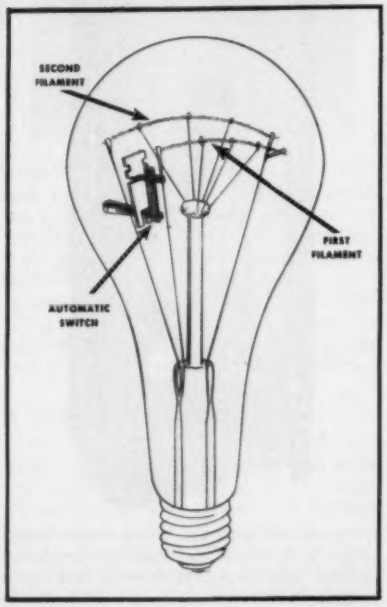
The elevating system is hydraulic with the pump driven from the engine crankshaft by a triple V-belt. The brake is of the external contracting, two-shoe type with the drum mounted on the driving worm shaft and interlocked with the clutch through the single pedal to cause an automatic release of the clutch and a setting of the brake if operator should step off of truck while in motion.

All controls are conveniently located with the gear shift and elevating control levers at the driver's right on top of the dash and the throttle in conjunction with his steady rest so he can maintain control over speed without relinquishing his hold on the grip.

All of the trucks are governed for a maximum speed of 7½ m.p.h.

◆ Automatic Two-Filament Lamp

An automatic two-filament lamp, the work of Paul Schwerin, an American inventor, has been announced by the Double-Life Lamp Co., Hoboken, N. J. This lamp utilizes two filaments and an automatic switch within the ordinary glass chamber. The automatic switch



changes the current to the second filament when the first burns out. A life of at least 2,000 hours is claimed for this lamp, which is suggested for use in locations where sockets are not easily accessible.

◆ Testing Sieve Shaker

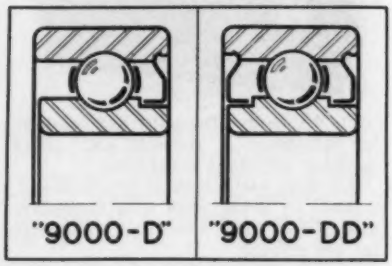
The Newark Wire Cloth Co., Newark, N. J., has announced a testing sieve shaker for use in the testing of fine materials. This shaker, designated as "End-Shak," is designed for 8" diameter testing sieves and is adjustable to hold any number of these sieves from 1 to 13 inclusive.

An outstanding feature claimed for the shaker is its combined recripocating and turning motion. The nest of sieves reciprocates in a direction lengthwise of the gear box and makes one complete turn on the horizontal each minute. The mechanism for operating the nest is entirely enclosed and operates while submerged in oil.

The entire machine, including a standard ¼ h.p motor and time switch, weighs 145 lb. It is 32" high and has a base, overall, that is 22"x 18".

◆ Self-Sealed Feltless Ball Bearings

Norma-Hoffmann Bearings Corporation, Stamford, Conn., recently announced its new "9000" series of self-sealed precision ball bearings. These bearings employ inwardly extending, closely-fitted flanged shields which do



not rotate or contact with rotating seal parts and which are stated to be equally effective in retaining grease in either a horizontal or vertical position.

One type, designated as "9000-D" series, utilizes a single side shield; while a second type, "9000-DD" series, employs two side shields. In the latter case, the bearings are totally sealed against the entrance of dirt or foreign matter during assembly or disassembly. Both types are available in a full range of sizes.

◆ Small A. C. Welder

Giant Grip Manufacturing Co., Oshkosh, Wis., has announced a new a. c. welder that is made in four models from 90 amperes to 300 amperes capacity. Two of the models have ten controls for amperage adjustment; while the other

two have sixteen. The welder is of the transformer type without reactance control, static high frequency arc or sheet metal attachment. It is equipped with rotating knife switch control with amperage distinctly marked indicating each step in welding.

◆ Machinery Ordered for Merrill Plant

The rehabilitation of the Grandfather Falls paper mill at Merrill, Wis., is progressing rapidly. It will be recalled that this plant was purchased by Joseph M. Ward, formerly connected with the Detroit Sulphite Pulp and Paper Company.

Mr. Ward has already taken up his residence in Merrill, new equipment has been ordered and the mill will be put into production as soon as possible. The plant will manufacture medium and heavy weights of high grade sulphite paper. Approximately 100 men will be employed.

◆ WM. D. RUSSELL, retired vice president of the International Paper Company, passed away at his home in Greenfield, Mass., January 5. He was 85 years of age. Mr. Russell was one of the founders of the International Paper Company, and served as vice president of the company from 1911 until his retirement in 1922.

◆ FRASER INDUSTRIES INCORPORATED, Madawaska, Maine, announces the appointment of F. W. Cole to the position of sales manager. The chief sales office, now located at 424 Madison Ave., New York City, will be moved to the Graybar Building, on or about January 20. Under Mr. Cole's direction, J. G. Conley will continue as manager of western sales with offices at 111 W. Washington St., Chicago.

◆ FOLLOWING THE RECENT announcement that Kieckhefer Container Corporation would build a mill in the South, it is now reported that the new plant will be located at Plymouth, N. C.

◆ OREGON PULP AND PAPER CO., Salem, Ore., will be refinanced under a plan whereby the holders of preferred stock will be enabled to exchange their 8 per cent interest shares upon which no dividends have been paid for four years, for 5 per cent income bonds. The bonds will be exchanged upon a basis of $133.33\frac{1}{3}$, face value, for each $100 par value of outstanding preferred stock and dividend rights thereunder.

◆ TRIMBEY MACHINE WORKS, Glens Falls, N. Y., advise that they have shipped eleven consistency regulators during the month of December. These regulators were shipped to Canada, Cuba, the States of Maine, Washington, Massachusetts and New York.

◆ Australian Mills to Study Eucalyptus Fibers

In co-operation with the Australian Council for Scientific and Industrial Research, the Australian Paper Manufacturers Ltd. are carrying on investigations with Australian timbers in papermaking. A fundamental study is to be made of the fiber characteristics of eucalyptus.

One of the objects of the studies is to observe the so-called secondary constituents of the wood pulp fiber in order to correlate them with the behavior of the pulps on beating. It has been found that quite strong sheets may be prepared from timbers having short fibers. Eucalyptus fibers, in addition, behave differently from softwood fibers on beating. It is hoped that the experiments will throw new light on the theories of beating as well as being of value to the Australian paper industry.

◆ W. HARLAN HENSZEY, district manager of The Patterson Foundry & Machine Company, Widener Building, Philadelphia, Penna., has announced the appointment of George L. Anderson who becomes connected with that office as sales engineer. Mr. Anderson is a Chemical Engineer (University of Pennsylvania) and has for twenty years specialized in the design, application and sales of process equipment in chemical, food and other industrial plants in the process industries.

◆ Southern Kraft Buys Continental

One of the important recent announcements in the industry was the purchase of the operating paper and bag properties of the Continental Paper and Bag Corporation by Southern Kraft Corporation, the Continental company having gone through bankruptcy proceedings. Both companies are subsidiaries of International Paper and Power Company.

The Continental Company owned a number of mills but had been operating at a loss. The Southern Kraft properties, however, have shown a satisfactory profit.

◆ IT IS REPORTED that the Chesapeake Camp Corporation will build a kraft pulp and board mill at Franklin, Va. J. L. Camp, Jr., head of the Camp Manufacturing Company, is president of the company. Rust Engineering Company of Pittsburgh is said to have secured the contract for construction of the plant.

◆ MARATHON PAPER MILLS, Rothschild, Wis., is reported to have had a very good year, with earnings twice as much for 1936 as they were for 1935. Present plans call for an important expansion program during 1937.

◆ COLUMBIA RIVER PAPER MILLS COMPANY at Vancouver, Wash., has just completed a new bleach plant. The plant has a capacity of 65 tons of high grade bleach sulphite pulp per day.

◆ Increase in Metallurgical Staff

A. J. Wadhams, vice president, The International Nickel Company, Inc., has announced the addition of Gerald R. Brophy to the development and research staff.

Mr. Brophy, who is well known in metallurgical circles by reason of his numerous papers presented before the engineering societies, and his many contributions to the technical press, will be located at the research laboratory of the company in Bayonne, New Jersey. His time will be devoted largely to research problems relating to nickel alloy steels, nickel cast irons and other ferrous materials.

◆ Container Plans Approved

The directors of Container Corporation of America, at a meeting held on December 1, 1936, approved the company's plans to build a southern kraft mill at Fernandina, Florida. Construction of the first unit for pulp production will be started immediately and officers of the company have just returned from Fernandina, where final details were completed.

The company will not require any new permanent financing in this connection, as the construction program has been planned within the cash resources prospectively available, amplified by moderate short term construction loans. Merritt-Chapman & Scott Corporation has been awarded the contract for construction of the first unit.

◆ RAINIER PULP & PAPER COMPANY, Shelton, Wash., is running full time. The mill also is being overhauled and additional machinery is being installed. Seventy-five men are employed in the work of remodeling.

◆ STOWE-WOODWARD, INC., Newton Upper Falls, Mass., announces that the price of rubber covered rolls was increased on January 1, 1937. This revision was made necessary because of increases in the prices of raw materials, higher wage scales and other factors entering into manufacturing costs.

◆ GERALD F. ALCORN, of the Weyerhaeuser Timber Company, Everett, Wash., has been accepted by the Joint Committee on Approved Pulp Testing Chemists as an approved pulp and paper mill testing chemist. This acceptance was effective December 16, 1936.

◆ EDWARD SHEAHAN, general manager of the Manistique Pulp and Paper Company, Manistique, Mich., passed away January 3, at the age of 64. Mr. Sheahan was general manager of the company for more than 16 years. He is survived by three sons and a daughter.

◆ McGarry to Wausau

The Wausau Paper Mills Company, Brokaw, Wis., announces the appointment of M. E. McGarry as vice president in charge of sales. His headquarters will be in Chicago in the company's sales office at 111 W. Washington Blvd.

Mr. McGarry brings to his new connection a very wide experience in both the manufacture and sale of papers, having spent ten years with The American Writing Paper Company and nearly eleven years with The Munising Paper Company.

◆ New Catalogues and Publications

Allis-Chalmers Mfg. Co., Milwaukee, Wis.—An attractive bulletin, No. 1181, covers this company's standard line of high pressure, non-condensing steam turbine units. The construction of these turbines is covered in detail including both photographs and drawings. One section of the bulletin is devoted to the detail construction of a.-c. generators suitable for this type of steam turbine.

Cleveland Tramrail, Wickliffe, Ohio—This company, a division of the Cleveland Crane & Engineering Co., has issued an addenda to the six Cleveland Tramrail "Why" folders. This addenda is titled "Unusual Overhead Materials Handling Devices." The piece is punched for insertion in regular binder and has two folds, making in all six pages. Many illustrations are included and the material is arranged under headings.

Columbia Alkali Corp., Rockefeller Plaza, New York City—A new, handy folder entitled "Liquid Chlorine" has been issued by this company. Liquid chlorine was recently added to the company's line of products.

Dayton Rubber Mfg. Co., Dayton, Ohio—A new catalogue, No. 180, covers cog belt and V-Flat drives and supersedes former catalogues on these products. The catalogue lists for quick and easy selection the proper combinations of standard belts and standard pulleys to meet any drive condition, telling at a glance the proper drive to use without any calculation or engineering. Copies on request.

DeZurik Shower Company, Sartell, Minn.—New literature from DeZurik includes a folder which asks the question, "Which kind of pulp and paper does your mill make?" with a further query, "Clean or Almost Clean?" All of the material in this bulletin is arranged to set up certain advantages of the company's knot saw in the manufacture of clean pulp. Another bulletin is devoted to DeZurik's easy opening plug valve.

Edge Moor Iron Works, Rockefeller Plaza, New York City—This company, with headquarters at Edge Moor, Del., has published a very striking new catalogue which covers all types of water tube boilers manufactured by it and also such accessories as water walls, air preheaters and waste heat boilers. The material is well prepared and laid out. The use of a large number of black and white drawings, with color display on the pages gives the catalogue an attractive appearance. There are halftones made from highly retouched photos, and the cover is a varnished job, increasing its appearance and usefulness. Copies gratis if requested on company letterhead.

Gifford-Wood Co., Hudson, N. Y.—This company has just issued a new catalogue of material handling equipment. In addition to many improvements in design and construction, the line of equipment has been amplified to meet practically every industrial requirement. Besides the descriptions, there are tables and drawings which will interest those planning new equipment or modernizing old material handling plants.

Leeds & Northrup Co., Philadelphia, Pa.—A broadside on "Power Plant Measuring Instruments, Telemeters and Automatic Controls" has just been issued by this company. Equipments for many power-plant measurements and controls are shown and described in compact yet complete form. Specific applications are mentioned in which these equipments are being used to safeguard operation and to effect operating economies. Ask for No. 160.

Link-Belt Company, 307 N. Michigan Ave., Chicago—A new Data Book on Link Belt silent chain drives has just been completed. The book has 96 pages, is 8½x11 and is designated as No. 125. There are installation pictures; engineering data; recommended drive selections; lubrication and casings; dimensions of wheel rims, hub sizes, bores, keys; chain adjusters; breaking pin hubs; electrical data, etc. The book is attractively printed on coated paper and has a stiff cover. Copies may be had by addressing any office of the company.

Louis Allis Company, Milwaukee, Wis.—Seldom does an industrial firm do anything so outstanding as did this company with the Christmas number of its house organ, the "Messenger." This number was done both as a holiday souvenir and in honor of the 70th birthday of its president, Louis Allis, who is lovingly referred to as the "Old Man." The book is replete with poems and pieces of philosophy that are in keeping with the Christmas season. There are full page illustrations, some in color, that have a particular appeal, and the varnished cover is a work of art.

Maas & Waldstein Co., 420 Lexington Ave., New York City—A portfolio which demonstrates the value of paper lacquer for protecting and enhancing the beauty of fine color work is being sent out by this company, lacquer manufacturer with plants at Newark, N. J. The portfolio contains two identical designs in six colors, one of which is just as it came from the press, while the other has been treated with a coat of Crystalustre, the company's new lacquer for paper and card board.

Manganese Steel Forge Co., Philadelphia, Pa.—A handy booklet by this company contains a list of applications of Rol-Man True Manganese Steel Products. These applications run through the alphabet and are indexed in the proper manner. The physical properties of Rol-Man are given and other data of interest are included. The last page of the bulletin gives information on Rol-Man pioneer steel welding rod. When writing ask for Bulletin No. R-83.

Patterson Foundry & Machine Co., East Liverpool, Ohio—This company has published in booklet form very complete and valuable information on processing kettles as used for the manufacture of synthetic resins and varnish, as used in the chemical and food industries. This material has been prepared by W. Wynard McConnell, chief chemical engineer of the Patterson company. There are several pages of illustrations.

Pennsylvania Salt Mfg. Co., Philadelphia, Pa.—This company has just issued a new bulletin of Useful Information on Aqua and Anhydrous Ammonia. There is particular reference to effective handling, first aid and other pertinent data. The text is amplified with curves (in color), diagrams and illustrations.

Precision Scientific Co., 1750 N. Springfield Ave., Chicago—In Bulletin TS 3000, instructions are given for conducting accurate B.t.u. tests with a Flow-Type Gas Calorimeter. This new manual contains detailed instructions, approved by the U. S. Bureau of Standards, on how to set up the apparatus and how to conduct an accurate test. It also includes essential calorimeter tables reproduced from the Bureau of Standards Circular No. 65, now out of print. Bulletin TS 3110 contains information and operating instructions pertaining to Wet Test Laboratory Gas Meters—how to set up and operate the meter—correction factors for gas volume, table showing gas rate per hour, etc.

Reeves Pulley Co., Columbus, Ind.—"Speed Control at Work" is the title of a booklet which is a brief inspection, both by word and illustration, of the methods employed by 12 nationally known manufacturers in securing complete speed adjustment of production machines in their plants. One section is devoted to the three basic units in the complete line of Reeves Speed Control equipment. This is a most attractive publication. It simulates a small book in appearance, even to its blue synthetic suede cover and gold edges. It is free on request.

Sinclair Co., Holyoke, Mass.—The new Sinclair Shurlock Deep Groove Winding Wire Cylinder Mould is the subject of Bulletin No. 50-C, recently issued by this company. The special mechanical features built into this Cylinder Mould are listed and correspondingly marked on a large diagrammatic illustration. Inquiries for further information will be welcomed and will be answered promptly.

Worthington Pump and Mach'y Corp., Harrison, N. J.—A new 8-page bulletin illustrating and describing the improved Mixflo centrifugal pump has just been issued. Photographs, sectional drawings and dimension tables are included. There is a complete description of the parts of the pumps, together with technical information concerning modern trends in hydraulic design. Copies on request.

BOOKS

Lockwood's Directory—The 1937 edition (62nd annual) of this directory for the Paper and Allied Trades has just been published. Every section of the book has been carefully revised. Due to the upward trend of business during the past year the material in the book is considerably expanded. The names of many new paper mills now under construction are included, making the book a complete directory of pulp and paper mills. The price is the same as formerly—$7.50 for either the regular or the special traveler's edition (pocket size with leather cover). If cash is sent with order, the price is $7.00. Orders should be sent to publisher, Lockwood Trade Journal Co., Inc., 15 West 47th Street, New York City.

National Directory of the Canadian Pulp and Paper Industries—The 1937 edition of this helpful volume, edited by J. N. Stephenson, has been released by the publisher. It is of the same general style as former editions, but has been revised and brought up to date. The book includes material on conditions in the industry during 1935, statistical data on forest resources, information on developed water power, directory of pulp and paper mills of both Canada and Newfoundland arranged according to provinces and then classified as to products, a listing of pulp and paper distributors, some information on the organizations of the pulp and paper and allied industries, and other material of ready reference character. The price of the book is $3.00 per copy. Its publisher is National Business Publications, Ltd., Gardenvale, P. Q.

Printing Papers—William Bond Wheelwright, the author of this book, is well-known to the papermaking industry. His ancestry is one of papermakers, and he himself has had a broad experience within the industry in both management and sales work and as an author. He likewise has been closely associated with the printing industry for some years, and now is editor of *Paper and Printing Digest.*

In this new book, Mr. Wheelwright in a number of well-defined chapters reviews some of the important events in the history of papermaking and discusses in a non-technical way the fibrous and non-fibrous constituents of paper, physical properties and characteristics of paper, principles of papermaking, machine methods of papermaking, atmospheric influences upon paper, press room troubles and their antidotes, finish and permanence of paper, thickness of paper as related to function, testing and judging paper, and other pertinent subjects. The book with a foreword by Dr. Otto Kress of The Institute of Paper Chemistry is a volume of 130 pages, well illustrated, and printed in a very readable style upon a good grade of book paper. It is the work of The University of Chicago Press, 5750 Ellis Avenue, Chicago, Ill., and is priced at $2.10 per copy postpaid.

◆ Huyck Makes Motion Picture Film

As a special service to paper-makers—and especially to mill operators charged with getting best results from their equipment—*F. C. Huyck & Sons* (Kenwood Mills), largest producers of paper-makers' felts, have just completed a talking motion picture film vividly depicting every important step in the making of a Kenwood Felt. Especially impressive are the scenes showing the sorting and grading of fine wools and the many laboratory tests and factory inspections, all aimed to insure high average performance over the longest possible period of time.

This 40-minute picture will shortly be released for request-showings under the direction of Kenwood field representatives to employee groups at leading paper mills throughout the United States. The film will also be made available to vocational classes in the various colleges offering instruction in modern paper-making.

The film is appropriately titled "Two Related Industries," and it is believed that its production marks a forward step toward a closer understanding between the felt-maker and the paper-maker, both of whom are primarily working toward the same objects—better paper, greater production, lower costs.

F. C. Huyck & Sons were prompted to make this picture by the fact that paper-mill executives visiting the Kenwood Mills at Albany repeatedly expressed the wish that there were some way in which their mill operators could see the care that goes into the designing and manufacturing of the felts they used. These executives particularly had in mind the many developments pioneered by Kenwood; and, in this connection, paper-makers viewing the picture on its tours throughout the country will be gratified to observe that many animated diagrams have been included, each depicting some function that a felt performs on a paper machine.

The new Kenwood film is the first of its kind ever to be made by a member of the felt industry and was produced by Caravel Films, Inc., of New York City, an organization enjoying an enviable reputation in this highly technical field.

◆ Procedure in Boiler Cleaning

While the boiler is cooling off, the ashes may be cleaned out of the combustion chamber and back connection. Also, a staging may be erected in front for work on headers and tubes and the tube cleaners, hose, and pump or compressor prepared for work. As soon as the boiler is emptied, front caps may be removed, manholes opened and drums washed out. Several men equipped with chisels, scaling hammers, etc., may enter the drums and begin the work of removing scale. As soon as caps are off, the tube cleaner should be started. Caps, nuts, bolts and binders should also be cleaned. Headers should be cleaned by chipping the scale deposits off with chisels and scaling hammers. The entire boiler should then be thoroughly washed out.

External surfaces of the tubes, headers and drums should also be cleaned. As a rule, the tubes must be scraped to clean off the slag accumulations, after which thorough blowing with a steam or air lance will remove the balance of the accumulations. Another method used in some plants is to wash off the tubes, after scraping, with water from a hose. Care should be taken to use no water until the setting is cool and it is better to use the hose while the tubes are full of water, as there is less danger of causing undue contraction.

Baffles and the combustion chamber should also be thoroughly cleaned. If the baffle walls are scraped, care should be used not to up-end any of the baffle tile, when the wall is of that type of construction.

Often it is assumed that boiler inspection should be left entirely to inspectors sent out by insurance companies. This is all well and good, except when emergencies arise between their visits, and further, it may fall to the lot of the operator to be called away from his plant to inspect and pass judgment upon old boilers which have never been introduced to an inspector.

Local or plant-operator inspection is ordinarily concerned not with calculations of boiler strength, but in watching for, or following the development of, defects such as bulges, cracks, warping, pitting and corrosion, which may progress

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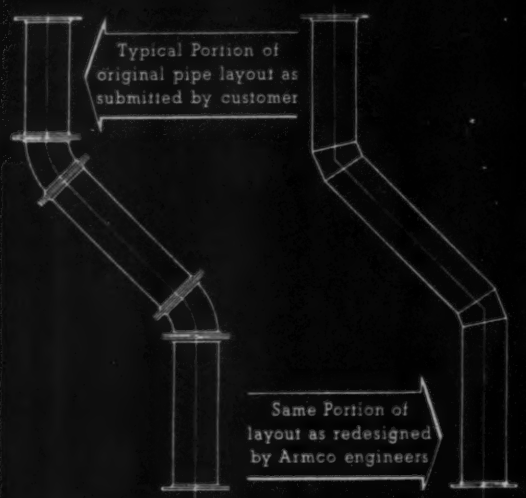
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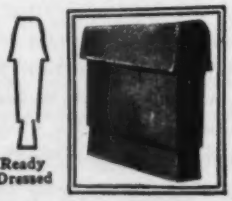

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from day to day and which should be reported to the insurance inspector on his regular visit. If the defect becomes serious, the local inspection may lead to shutting down the unit and requesting the insurance inspector to make a special visit.

The outfit necessary for this work consists of a union overall suit which fits snugly, yet allows freedom of movement. It must close tightly at the buttoned seams, wrists and ankles. A close-fitting hood should also be provided. The necessary tools are a small cross-peen hammer, a cold chisel, a small pair of pliers, a file, a gauge-hand lifter, a small screwdriver and a standard test gauge. A good light should also be provided. Kerosene lights are dangerous because they may be upset and catch fire. An electric extension cord is satisfactory, provided it is in first class condition and all metal parts thoroughly insulated. For all around safety there is probably no better boiler inspecting light than an old-fashioned candle.

Preparation of a boiler for inspection consists of cooling down the boiler, draining it, and cleaning it both internally and externally. Do not forget to remove the soot and ash accumulation from the combustion chamber and remove all clinker and ash from the grates.

All firebox and shell plates should be carefuly gone over externally for signs of corrosion, cracks, blisters or bulges. Burned shell plates must be wached for, particularly above the grate. Each seam should be carefully scraped and signs of leakage and wastage noted. Special attention must be given to the blowoff pipe; look for corrosion at its connection to the boiler; see that it is free to move with expansion, and that this pipe is protected from the direct action of the hot gases. Blowoff valves should be inspected for leakage.

Back arches should be placed so that they just clear the top row of tubes and they should not come up tight against the boiler head. The rear bearer lugs, plates and rollers should be inspected to see that they are functioning properly. Clean around rivet heads and tube heads because they may suffer from corrosion. It may be necessary to drill corroded heads to determine their thickness; these holes can later be tapped and plugged.

General corrosion and tube and seam leaks must also be looked for on the front head. Careful attention should be given to the location of the try-cocks. The water column should be of ample dimensions and connected so that there will be no air traps. Tees and crosses should be used in the place of elbows on water column connections so that each pipe length can be inspected for choking by scale deposits.

Damage from overhead leaks, which drip on the boiler plate, should be carefully noted. The inside heads of cross drum boilers set in batteries should be clear of brickwork so that leaks and corrosion may be detected.

No inspector should enter a boiler until he has assured himself that the operators know of the work he is doing, and that the steam connections to the boiler are locked closed. Inside the boiler, the inspector must see that the feed water does not impinge directly on either tubes or shell. He must note incrustation, cracks, pitting and corrosion on shell, tubes and heads. Note the condition of the fusible plug and remove any scale deposit.

Finally, the pressure gauge must be tested. The safety valves should be set and checked by noting the pressure at which they blow off when the boiler is under pressure. Boiler brickwork, insulation, front, firedoors, and baffles should be examined to see that they are in first class repair.

Every condition noted during an inspection should be briefly but carefully written down and filed so that a complete record will be on hand at all times.

◆ New Sulphate Pulp Mill Established in Germany

A new mill for the manufacture of sulphate pulp is under way at Kuestrin, a town about half way between Berlin and the Polish frontier. The plant is being put up by some of the leading paper and board companies who are receiving the support of the Wirtschaftsvereinigung Natron-Papier und Papiersaecke G.m.b.H. (the cratel for the sulphate paper and paper bags industry). The plant, which will have an estimated capacity of 20,000 to 25,000 metric tons (metric ton = 2,204.6 pounds), annually, is expected to be in operation before the end of 1937.

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New Bulletin 370 is just off the press and contains complete information — address:

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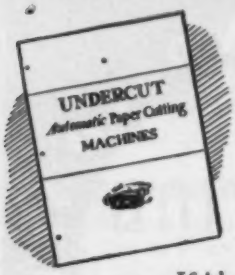

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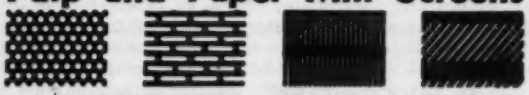

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The Paper Industry Safety Contest

July 1, 1936 to June 30, 1937
Cum. Scores as of November 30
22 Mills Have Perfect Record

PERFECT SCORES
Division 1—Paper and Pulp Mills

	PARTICIPANT	MILL	LOCATION
GROUP A			
GROUP B	Continental Paper & Bag Corp.	York Haven	Pennsylvania
GROUP C	Strathmore Paper Co.	West Springfield	Massachusetts
	Strathmore Paper Co.	Woronoco	Massachusetts
	Kimberly-Clark Corp.	Lakeview	Neenah, Wis.
GROUP D	Southern Extract Co.	Knoxville	Tennessee
	Bird & Son, Inc.	Phillipsdale	Rhode Island
	United States Gypsum Co.	Gypsum	Ohio
	United States Gypsum Co.	No. Kansas City	Missouri
	Mead Paperboard Corp.	Nashville	Tennessee
	International Paper Co.	Webster	Orono, Maine
	Hollingsworth & Whitney Co.	Aroostook & Cobbossee	Gardiner, Maine
	Rogers Fibre Co., Inc.	Bar Mills	Maine
	International Paper Co.	Riley	Maine
	Central Fibre Products Co.	Vincennes	Indiana
	Central Fibre Products Co.	Mt. Carmel	Illinois
	Hollingsworth & Whitney Co.	Abenaquis	Madison, Maine
		Division II	
	Union Bag & Paper Corp.	Specialty	Hudson Falls, N. Y.
	Container Corp. of America	35th Street	Chicago, Ill.
	Union Bag & Paper Corp.	Grocers	Hudson Falls, N. Y.
	Container Corp. of America	Anderson	Indiana
	Texas Corrugated Box Co., Inc.	Dallas	Texas
	Bemis Bros. Bag Co.	East Pepperell	Massachusetts

IMPERFECT SCORES

	Key Number	Rank	Disabling Injuries	Frequency Rate
GROUP A	P-106	2	4	3.584
	P- 28	3	7	3.602
	P- 25	4	2	3.996
	P-121	5	3	4.147
	P- 27	6	6	4.641
	P- 13	7	5	6.432
	P- 21	8	4	7.345
	P- 9	9	11	8.738
	P- 58	10	5	8.880
	P- 19	11	6	9.267
	P- 39	12	8	9.967
	P- 44	13	8	10.012
	P- 18	14	10	10.028
	P- 23	15	6	10.117
	P- 62	16	9	10.352
	P- 64	17	8	10.495
	P-101	18	7	10.574
	P- 2	19	7	11.286
	P- 84	20	10	11.644
	P- 12	21	8	12.457
	P- 67	22	15	12.773
	P- 69	23	11	15.205
	P- 1	24	19	15.266
	P- 87	25	14	17.407
	P-107	26	9	17.909
	P-127	27	13	22.468
	P-102	28	19	22.480
	P- 83	29	16	23.341
	P- 95	30	14	23.563
	P- 73	31	26	25.346
	P-126	32	51	33.833
	P- 40	33	21	37.574
	P- 74	34	19	40.408
	P- 71	35	28	46.005
	P- 45	36	26	51.396
	P- 32	37	32	53.798
GROUP B	P- 60	2	1	2.408
	P- 15	3	1	2.787
	P- 72	4	1	2.886
	P- 51	5	1	3.071
	P- 68	6	2	4.565
	P-100	7	2	5.831
	P- 11	8	3	6.534
	P- 26	9	3	6.614
	P- 3	10	3	7.888
	P- 22	11	5	10.262
	P-112	12	4	10.421
	P- 59	13	4	12.407
	P- 70	14	6	12.945
	P- 4	15	6	17.893
	P-104	16	6	18.213
	P-105	17	8	20.113
	P- 54	18	7	21.873
	P- 76	19	6	25.055
	P-120	20	7	28.951
	P-124	21	9	30.135
	P-128	22	15	35.607
	P-123	23	17	40.868
	P- 82	24	19	40.871
	P-122	25	17	42.408
	P- 16	26	19	46.279
	P- 46	27	26	62.845
	P- 77	28	15	67.985

	Key Number	Rank	Disabling Injuries	Frequency Rate
GROUP C	P- 55	4	1	3.596
	P- 48	5	1	3.607
	P- 52	6	1	4.325
	P- 56	7	1	4 403
	P- 75	8	1	5.739
	P- 49	9	1	6.286
	P- 61	10	3	12.466
	P- 37	11	4	15.238
	P- 43	12	3	15.487
	P-103	13	3	16.206
	P- 14	14	3	16.803
	P- 94	15	3	18.596
	P- 29	16	6	23.2 3
	P- 41	17	6	25 955
	P- 17	18	6	30.874
	P- 34	19	7	35.446
	P- 30	20	10	37.922
	P- 50	21	8	44.771
	P-111	22	10	49.993
	P- 33	23	12	52.615
	P- 47	24	14	59.782
	P-113	25	18	71.191
GROUP D	P-117	13	1	8.416
	P- 98	14	1	8.789
	P- 36	15	1	9.097
	P- 90	16	1	10.418
	P- 42	17	1	11.738
	P- 86	18	1	15.913
	P- 99	19	2	25.779
	P-116	20	4	26.660
	P- 5	21	4	27.893
	P- 85	22	1	32.629
	P- 91	23	5	33.813
	P-108	24	4	34.790
	P- 81	25	4	35.415
	P- 6	26	5	35.776
	P- 53	27	4	38.275
	P-118	28	4	40.263
	P-125	29	3	42.763
	P- 65	30	4	49.119
	P- 80	31	8	54.346
	P-129	32	19	162.065
		Division II		
	R- 6	7	1	1.833
	R- 2	8	2	5.329
	R-11	9	1	8.149
	R- 1	10	3	13.021
	R- 3	11	2	17.680
	R-21	12	7	17.884
	R-13	13	2	18.428
	R-18	14	3	18.807
	R- 5	15	8	20.380
	R-14	16	2	47.038

No November Report—4 mo. total only: P-105, P-54, P-124, P-120.

Report delayed, 3 mo. total only: Int. Paper Co., Orono, Me., P-77, P-83, P-76, P-74, P-120, P-75.

Withdrawn: P-115.

Salvage of screenings and knotter rejects often reach $150 a day.

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This business-like piece of equipment is a Bauer Double-Disc Refiner, a machine that refines and prepares a wide variety of stocks for the paper machine, on which work it is actually outstanding.

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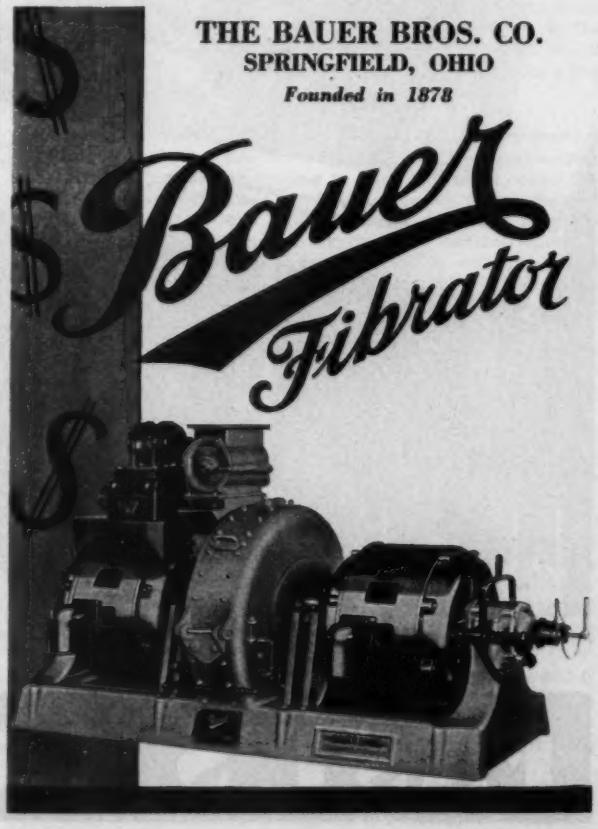
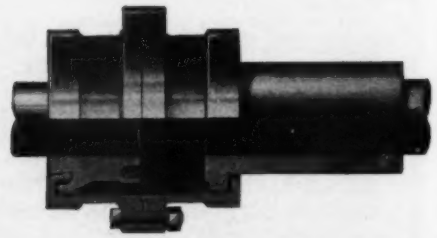


Experience

Leads Union Bag and Paper Corporation to Specify Fast's Couplings

Battery of ten Jordan engines, Union Bag and Paper Corporation, equipped with Fast's Telescopic Couplings.



THE illustration above shows Fast's Construction. A full twelve inch travel of the plug has been provided for.

PAPER mill engineers are learning that the life of Jordan linings is prolonged when Fast's Telescopic Couplings are used.

Fast's Couplings allow the Jordan plugs to rotate on their true axises. The crank action produced where unbalanced types of couplings are used is entirely eliminated. This causes the Jordan linings to wear evenly, greatly prolonging their useful life.

Another important advantage is that the adjustment of the plug is made easy by Fast's Couplings. There are no "hard spots" to contend with because the driving or contact surfaces are protected against wear by a positive film of clean oil. Its quick and easy adjustment and dependable performance under the the most severe working conditions have made Fast's Couplings standard equipment with the most progressive manufacturers.

When purchasing Jordan engines specify Fast's Telescopic Couplings and reduce operating costs.

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FAST'S COUPLINGS

POWER

GENERATION + UTILIZATION + MAINTENANCE

This section turns the searchlight on power and its allied problems, showing big possibilities to save. Opportunities to improve conditions, methods, apparatus will be discovered. Worth while practices suggest new ideas and wider usages of equipment.

By W. S. JOULE

◆ Poor Alignment and Centrifugal Pumps

Bad alignment is the cause of most of the operating troubles of centrifugal pumps used for industrial purposes. Especially is this true for the smaller-sized pumps. One of the most common signs of this defect is vibration. When this is noticed, the pump should be checked up for alignment with the motor or engine by which it is driven. A centrifugal pump and motor may be lined up perfectly on a cast-iron bed plate, but if this is screwed down firmly on an uneven foundation it is an easy matter to pull the pump and motor out of line. For this reason, the alignment of centrifugal pumps should be checked up after they are bolted down in position, even if they were in line when there was no strain on the bed plate. The alignment can be checked by placing a straightedge across the coupling at four or five places around the perimeter and by passing a distance gauge between the two halves of the coupling to make sure that they are the same distance apart all around.

Centrifugal pumps are sometimes thrown out of line by the disintegration of concrete foundations. When there is any chance of a foundation becoming oil-soaked, stone should be used in preference to concrete.

◆ Boiler Room Instruments Essential to Economy

As the art of developing electric power has progressed, the necessity of tracing the energy through to the busbars has been more and more appreciated as a check on efficient operation.

First of all, it is absolutely necessary to keep track of the coal put into and the energy taken out of the plant. The integrating watt-hour meter and the coal scales may, therefore, be regarded as imperative requirements. Of these the coal scales are the more often neglected. It is not necessary that the weighing apparatus should be continuous and automatic, but it is of the utmost value that the amount of coal per hour as well as per day should be estimated with considerable accuracy.

To obtain the largest number of kilowatt-hours per B.t.u., it is essential to study the losses along the route from the coal pile to the busbars. In this analysis the facilities for studying the efficiencies of conversion of coal energy to steam energy have too long been neglected, but it is encouraging to see a tendency toward the use of more measuring devices in the boiler room. The fundamental factor required is the evaporation of the boiler reduced to standard conditions per pound of coal fired reduced to combustible. This figure establishes the gross boiler efficiency. The steam meter should be combined with measurements of steam temperature, and the water measure of course with its own measure of temperature. Any failure of proper evaporation means trouble with furnace or boiler. The flue-gas temperature and the CO_2 recorder help to locate the cause. When the combustion is good as indicated by the latter, the former gives some very suggestive information as to condition of the boiler surfaces. It is unfortunate, however, that the continuous CO_2 recorder, which furnishes very valuable information, is, generally speaking, a somewhat delicate piece of apparatus and none too responsive to changes, resulting from rapidly changing firing conditions.

Such in the rough are the data up to the prime mover. Then one can start back from the generator, in which the losses, being small, can be estimated very closely, and detect any failure of the prime mover to utilize its steam properly. At this point come the measurements on the condensing equipment. All these data can be obtained in a large plant without great difficulty or forbidding expense.

◆ AN AUTOMATIC stop valve is just as much a necessary safety device for a boiler as a safety valve. And an automatic valve doesn't cost over 5 per cent more than an ordinary stop valve of like size. Then considered as safety insurance the investment in a good automatic valve for each boiler is about as much for the money as could be had in most any other way.

◆ Keep Everlastingly at It

Maintenance work about a power plant generally means a great amount of hard work, not alone from the viewpoint of physical effort and time but from the viewpoint of study and a perseverance which will not allow any part of the work to be slighted.

Many parts of a big job tend to go easily and often the worker is tempted to slide over them as if they were inconsequential and did not deserve the same degree of attention as other parts of the job. Then there are other parts of the work which are extremely difficult and tedious, again offering the opportunity to the worker to pass over them in as easy a manner as possible, much to the detriment of the successful operation of the equipment.

This attitude soon may become a habit, with the result that the person who practices it will shirk every job which he undertakes. His motto becomes that of the easiest way and he unconsciously undermines his own character because he will not stick to a job until it has been completed in the best possible manner and better than he had performed the same job or one similar at a previous date.

In operative and maintenance work, it often occurs that the same job must be performed a number of times. Each time it must be done a little better, this being possible because of perseverance in the study of cause and effect and in doing the work in the best possible way. Each time some advancement is made until finally the difficulty has been overcome. It has become a worth while accomplishment. It has built character and inspired confidence, not only in the individual but also in those with whom he is associated and in those who come to know of his work.

◆ NOT MANY YEARS ago combustion control was supposed to require only something to turn things on when the steam pressure dropped a few pounds and shut them off when the pressure went up again. Such control often increases the coal bill in order to hold a uniform steam pressure. Combustion control is now understood to require the graduated adjustment of fuel and air supply in the correct proportion to each other and both in proportion to small changes in load. The best proof that such control results in worth-while savings is to be found in the hundreds of plants that installed such equipment and where the records conclusively prove the savings effected.

◆ ALL IMPORTANT BEARINGS, even of the self-oiling type, should be examined at frequent intervals. In many plants it is the practice to inspect all motor and generator bearings, at least once each day, and to thoroughly overhaul all of the line shaft bearings either once every six months or once a year, depending upon the nature of the work. This means taking the bearings to pieces, thoroughly washing all parts, cleaning out the oil wells and refilling with fresh oil.

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TECHNICAL DEVELOPMENTS

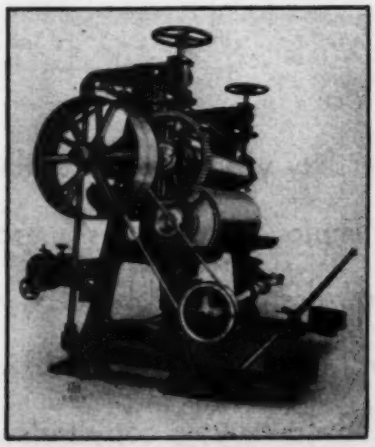
The following abstracts are of the latest developments found in the foreign press.

IN THE PAPER INDUSTRY

◆ Embossing of Paper

The figure illustrates a modern embossing machine. Embossing is a special process, and takes place on embossing calenders in which an engraved steel roll runs over an elastic roll. Since the rolls run against one another under a pressure of 7000 kg. (per sq. meter?) and since smooth runs of 20 to 80 meters per minute may be possible, the framework of the embossing calender must be built sturdily. The frame must also permit changing of rolls. The elastic roll (or paper roll) ordinarily has fixed open bronze bearings. The engraved steel roll runs in closed bronze bearings subjected to great strain, in which careful lubrication is required. The two rolls may be brought together by the use of screw spindles. This gives a fixed, invariable pressure. However, the use of a lever arm or a double leverage system allows for elasticity and preservation of the paper roll. It also permits the maintenance of any desired pressure by using weights. However, hydraulic pressure, so useful on larger glazing calenders, is not applied to the relatively small embossing machines. Off-reeling and rewinding devices are fastened directly to the frame or by means of a sole plate. The article gives precautions for the winding of embossed paper, which cannot be wound as tightly as in the case of plain sheets.

The power usually required for an embossing calender is 3 to 5 horsepower,



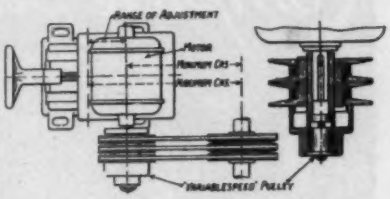
and is transmitted mechanically by electric motor which through cogwheels transmits power to the engraved roll, which drives the paper roll over a pair of gears the construction of which is highly important. Siemens-Martin steel is used. Specially hardened steel is used in at least the smaller cogwheel serving the embossing roll. The article describes in some detail the conditions that must be met by these cogwheels. Preliminary study of embossing designs is best made before ordering steel rolls from the engraving works. Usually, with ordinary paper, the wear on the embossing roll is small, but this is not always the case with coated papers, especially those containing mica, bronze powder, etc. Chromium plating lengthens the life of the embossing roll. Such rolls are made only as wide as absolutely essential, since their cost increases with their width.

Usually the working width for paper varies from 80 centimeters to 1 meter. Large diameters in steel embossing rolls are seldom warranted. For speeds of about 20 meters per minute, and a working width of 80 cm., the approximate diameter is 150 mm. For speeds of 80 meters per minute the diameter is about 330 mm. These rolls should have a slight camber; for example, rolls 80 cm. wide and 150 mm. in diameter should have a camber of 2-3 mm. The elastic roll ordinarily has nearly the same diameter as that of the steel roll, where high speed embossing is carried out. It has been shown that, to make provision against slipping, it is advisable to have the circumference of the elastic rolls a few millimeters larger than that of the sheet rolls. With normal embossing calenders, the ratio of diameters of elastic to steel rolls is approximately 2 to 1. These differences in circumference and their effect on embossing are discussed. The elastic rolls are mantled with wool or linen paper, hydraulically laminated together on an iron core. Uniform quality over the entire width is essential.

In most embossing operations, the design must be pressed into the paper roll, which serves as a matrix. This is enhanced by sponging the latter with water (followed by alcohol) or with a very dilute soda solution (followed by thorough washing with water), and then running the calender under pressure until the roll has dried. This moistening process should be repeated after each extensive shut-down (e.g., over night), and also whenever foreign materials, creases, etc., have marred the surface of the matrix. The cleaning of these elastic rolls is described in some detail. It is advisable to rewind paper prior to embossing. High temperature embossing gives a two colored effect. Here a hardened, smooth paper roll must be used, and is driven by friction from the steel roll. Temperatures in the (hollow) steel roll are approximately 100-120 deg. C. Such embossing is often effective in the case of rough paper, or unglazed coated paper. Embossing is in general use in the colored and wall paper industries and is also applied to high grade wrapping paper. Anonymous: Wochbl. Papierfabr. (Tech. Teil.) 67, No. 39, 723-5; No. 40, 744-6 (1936).

◆ Variable Speed Drive

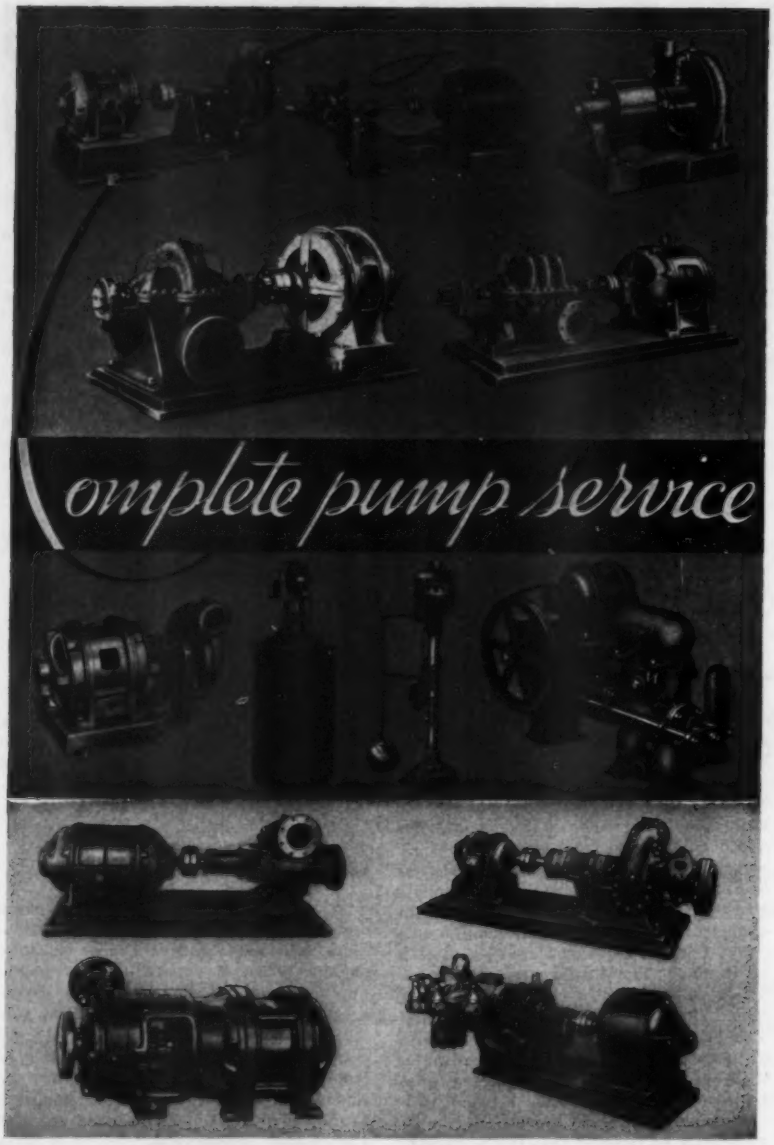
This patented variable-speed drive has recently been marketed and is shown in the figure. An adjustment of the pitch diameter on the pulley cone causes the variation. Both driver and driven pul-



ley remain axially in alignment, and a variation ratio of 2:1 may be obtained on the single drive. Powers up to 100 h.p. are available. Engineer: Paper-Maker and Brit. Paper Trade J., 92, No. 4 (T.S.) 147 (1936).

◆ Spruce Lignin

An address delivered before the Verein der Zellstoff u Papier Chemiker u-Ing., gives a survey of the results obtained on the chemical constitution of lignin (up to December, 1935). Earlier hypotheses regarding lignin have been substantiated by the isolation of 25-30 per cent veratric acid and 15-20 per cent isohemipinic acid. This means that the lignin contains at least 40-50 per cent aromatic nuclei, especially since the yield figure of isohemipinic acid is probably a minimal one. The work of Erdtmann is stressed. He subjected isoeugenol to very mild oxidation with ring formation (similar to that assumed in lignin formation) to the dehydroisoeugenol. Further oxidation of the latter gives rise to the very stable (so-called) Erdtmannic acid, which forms sulphonic acid derivative with sulphurous acid. The author considers it very doubtful whether lignin undergoes deep-seated decomposition when it is isolated from wood, since the properties of lignins isolated by various methods are still very similar. Data are presented in favor of the viewpoint that genuine lignin (i.e., that preformed in the wood) may be identical with isolated lignin. The aromatic nucleus is certainly preformed (according to Freudenberg). It is simply a question as to whether genuine lignin is less highly polymerized than is the isolated substance. A condensation between cellulose and lignin is excluded except possibly at the very



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surface of cellulose crystallites. There is certainly no stoichiometric relationship between lignin and cellulose. On the other hand, there may be a chemical combination between lignin and the hemicelluloses of the spruce. This is quite probable in the case of beechwood lignin, and highly probable with regard to the lignin of straw. These hypotheses are elaborated further. The so-called cellulose anhydride suggested by Hilpert (cf. THE PAPER INDUSTRY, Feb., 1936, pp. 879-880) appears untenable from the standpoint of sugar chemistry, and cannot be the mother substance of phenolic bodies. The author also dismisses the claim that through certain methods of separation, that fraction ordinarily termed lignin, will yield a certain amount of cellulose. Karl Freudenberg: Z. Angew. Chemie, 49, 140 (1936), through Papierfabr. 34, No. 47 (abstracts) 254 (1936).

◆ Welded Sulphite Digesters vs. Riveted Digesters

The experimental digester made of boiler plate was electrically welded, and was operated under a working pressure of 7-8 atmospheres. A riveted digester

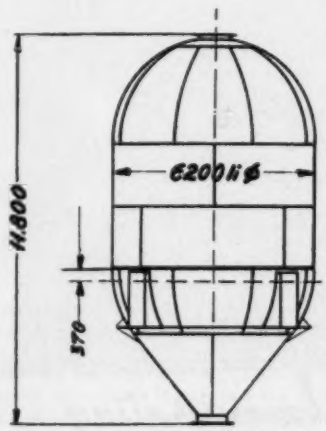
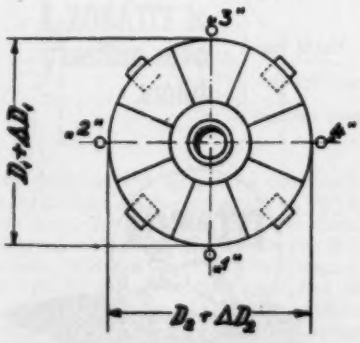


Fig. 1



having the same form, size, mantle strength and working properties was used in a series of comparative experiments. Figure 1 shows the welded digester. The following comparative data are of interest. The weight of the riveted digester was 85,000 kilos (without framework). The time for building it was 21 weeks. The expansion under a cold hydraulic pressure of 12 atmospheres was 8.1 mm. (in length) and 2.0 mm. (in diameter). The weight of the welded digester was 62,500 kilos; the period for its construction was 14.5 weeks and its expansion under cold hydraulic pressure of 12 atmospheres was 3.97 mm. in height and 1.8 mm. in width. The total over-all length of seams at which welding took place was 154 meters. Measurements of the changed diameter were carried out through the use of four Zeiss micrometers (accurate to 0.01 mm.) at four equidistant points on the diameter, 37 cm. below the line separating the cylindrical portion of the digester from the lower spheroidal part. The level of their placement is shown in Figure 1 by the dotted line; the small circles in the lower (section of Fig. 1) show their placement. A flat angle iron, one end of which was buried in concrete, served to hold each micrometer in place. (See Figure 2.) A vertical measuring instrument was attached above the head of the digester, and changes in its

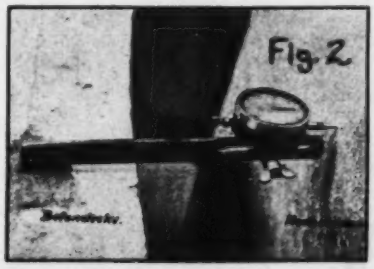


Fig. 2

position occasioned by expansion were read of by a levelling instrument. Figure 3 shows that the changes in diameter were a linear function of the hydraulic pressure exerted within the digester. Measurements taken with rising temperature check quite closely with those taken with falling temperature, and the digester reaches its original form when the pressure falls to zero (from 12 atmospheres). This finding, coupled with the fact that expansion was somewhat less than in the case of a digester with riveted joints, is of interest. After the experiments with water pressure, the experimental welded digester was put under steam pressure for 7 hours. This showed that rusting took place on the mantle but not at the welded seams. The latter evidently were not the weak spots of the digester. Measurements were then made during actual cooking operations (16 hours), which are described in detail. Measurements were made every thirty minutes. These included the pressure within the digester at any particular stage of the operation, obtained as a mean value by the use of 3 manometers; micrometer readings at the four radial points of the digester; the temperature of the digester contents (at two different points); and the surface temperature of the digester mantle, measured by the use of a thermo-electric pyrometer. The mathematical treatment of these readings is given, together with an expansion and contraction curve showing changes in the diameter of the digester during the cook. Here, too, there is a linear relationship between expansion and pressure. This, then, is a purely elastic expansion. Permanent changes in form were not noted. With a pressure of 7 atmospheres (under actual cooking conditions), the

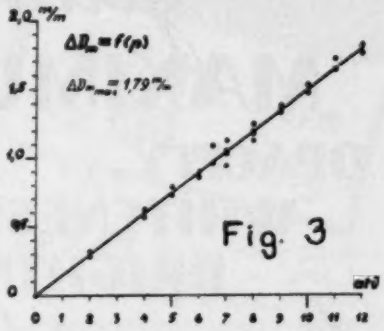


Fig. 3

maximum reached in the digester, the diameter of the digester changed only 0.98 mm. (as compared with 1.05 mm. under a water pressure of 7 atmospheres. All in all, these experiments indicate that the welded digester is fully as well suited to the sulphite digestion as is the riveted digester. The price of the former is lower, and the prejudice against welded digesters appears to be ill-advised. *(Abstractor's note:* The number of times which the welded digester was actually used in experimental cooks is not stated. In other words, the life of such a digester still appears in doubt, despite the very favorable experimental data and the carefully run experiments recorded by the author. Ewald Kostersitz: Der Papierfabr. 34, No. 26 (Fest u Auslandsheft), June, 1936, 229-234.

◆ Re-use of Marginal Strips From the Paper-Web

This article outlines the functioning of equipment described in German Patent No. 629,349, which has now been applied in various paper mills. The results are entirely satisfactory. The device allows for quantitative, immediate recovery of that part of the paper web which is trimmed off at the edge by the use of a water jet. The advantages claimed are the smooth running of the web over high-speed paper machines, and subsequent prevention of breaks on couch or wet presses and of broke obtained at the dry end. The paper ribbons trimmed (off-cuts) are immediately utilized. Figure 1 shows a side elevation of the device; Figure 2 illustrates a sectional view; Figure 3 gives the ground plan. A sliding or displaceable roof (c) in part covers the open portions of two containers (a) and (b); one side of (c) is vertical, and this arm serves as a partition separating the off-cuts from the couch broke. The other arm of (c) deflects this broke into a pit. By using spindle (d) and hand-wheel (e), (c) may be so adjusted that only the off-cuts fall into (a) and (b). The couch broke is collected in a special conduit whence, admixed with waste

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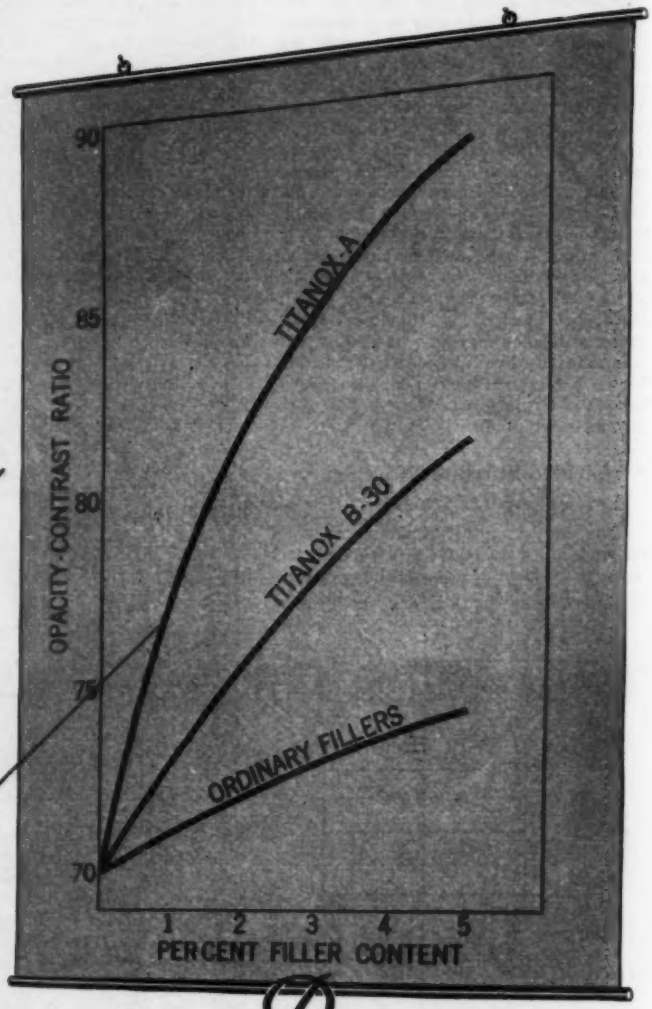

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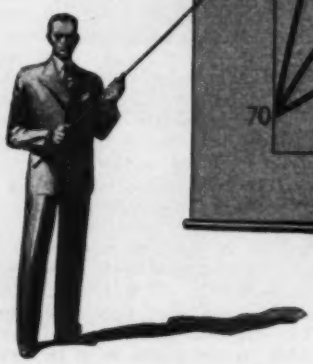

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water, it is drained off and recovered in the usual way. The pipes (h) connect (a) and (b). Water from the wires, which serves to disintegrate the off-cuts, comes from the pressure pipe of the wire-water pump, and enter (a) through pipes (g) and (f). The whirling action of the water, introduced according to the counter-current principle, causes the disintegration, and the stock thus formed is washed through (h) into (b), where it undergoes the same process, from which it is sucked off through pipe line (i) to the pump which returns it for immediate use to the paper machine. The usefulness of this mode of recovery

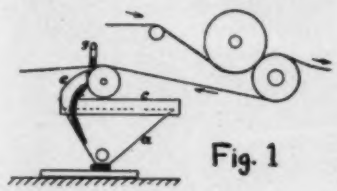

Fig. 1

can be gauged from the following example: A machine having a working width of 2 meters produces 200 kilograms of paper per hour. Provided edgings 2 centimeters in width are removed at each side (ordinarily a 2 per cent waste), the device permits a recovery of 384 kilograms in 24 hours. This (in current German practice)

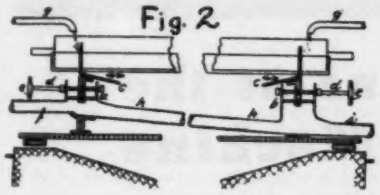

Fig. 2

amounts to a saving of roughly 960 marks for a month of 25 working days. If, however, these trimmings fall from the wire directly into the main pit, are mixed with waste water and are used in the filling and emptying of beaters, a large part of fine fibers, dyestuffs, chemicals and size are lost because of the

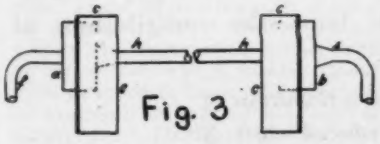

Fig. 3

high dilution, and impurities can easily be introduced by the old stock, in which case overweight may result in the sheet. Other advantages of the device are discussed. Wider ribbons may be trimmed off without resorting to the practice of later separating the off-cuts at the reeler and slitter, which necessitates repulping at a loss of steam power and labor. The backwater filters also have less work to do. Variations in the substance of the web by reintroduction of trimmings are prevented by the cautious separation of couch broke and ribbons referred to above. Wilhelm Kittner: Wochbl. Papierfabr. 67, No. 33, 615-616 (1936).

◆ Pulp Produced by Nitrogen Dioxide

The advantages claimed for pulping by means of HNO_3 are: shortened duration of the cook, digestion under atmospheric pressure, the possibility of a continuous cooking process, relatively small floor space requirements, and the good quality of the pulp obtained. The induction of so-called V_2A steel has speeded up the development of the nitric acid pulping process. The raw material used in Japan is *Pinus Silvestris* (the locally grown Scotspine). In laboratory pulping experiments, nitric oxide (NO) was formed from saturated solutions of sodium nitrite, ferric chloride, and fuming HCl. Thereupon the nitric oxide is converted by oxidation into nitrogen dioxide (NO_2). Prior to the delignification the wood was steam treated in the digester.

Three sets of experiments are reported. In experiment No. 1, 60 grams of wood shavings were treated at 97 deg. C. for 90 minutes with 0.144 grams NO_2 per minute (i.e., a total amount of 13 grams NO_2). The residual pulp was washed with 500 cc. water and then treated with 450 cc. of 0.5 per cent NaOH. The yield was 38 per cent and uncooked material amounted to 17.5 per cent. In experiment No. 2, 50 grams of the wood shavings were treated for 2 hours at 60 deg. C., and for another 2 hours at 97 deg. C. with 25.99 grams of NO_2 (.1083 grams per minute). The pulp residue was then washed with 500 cc. H_2O and divided into two parts, the first of which was washed with 450 cc. 0.5 per cent NaOH, giving a pulp yield of 50.5 per cent (with 3 per cent of unpulped material). The second portion of the residue from experiment No. 2 was washed with 450 cc. of 4 per cent NaOH. This yielded 43.5 per cent pulp (with 3 per cent unpulped material). Experiment No. 3 involved the treatment of 50 grams sawdust with 20.98 grams NO_2 (2 hours at 60 deg. and about 1.5 hours at 97 deg. C.), washing with 500 cc. water, and subsequently with 450 cc. 0.2 per cent NaOH. The pulp yield here was 44 per cent, with practically complete delignification. As compared with a sulphite pulp found in an experimental cook requiring 14 hours, the material resulting from experiment No. 3 (and also from the second part of experiment No. 2) showed a slightly higher alpha cellulose content (90 per cent as compared with 89.4 per cent), a higher pentosan content (4.5 per cent as compared with 2.84 per cent), a lower ash content (0.12 per cent as compared with 0.37 per cent). The copper number was 1.2. An experimental HNO_3 digestion requiring 18 hours gave a 46.1 per cent pulp yield, of which 87.7 per cent was alpha cellulose. Here the pentosan content was 4.95 per cent, the ash 0.64 per cent and the copper number 0.48. The high pentosan content is ascribed to so-called oxycellulose formation due to the action of nitric acid. J. Shimoda: Cellulose Industry (Japan) 12, 3-5 (1936), through Papierfabr. (Fest und Auslandscheft (June, 1936.) (Abstracts) p. 137.

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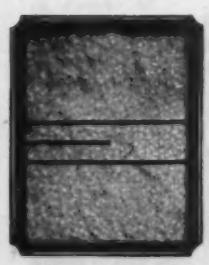

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Hamilton Felts

PAPERMAKING PATENTS

IN THE UNITED STATES

Inquiries with reference to any of these patents should be addressed to James Atkins, Munsey Building, Washington, D. C.

Compiled by James Atkins, Registered Patent Attorney

20,200—Treatment of Digestion Liquors. Albert D. Merrill, Watertown, N. Y., assignor to Chemipulp Process Inc., Watertown, N. Y., a corporation of New York. Original No. 1,945,504, dated January 30, 1934. Serial No. 622,619, July 15, 1932. Application for reissue January 29, 1935. Serial No. 3,986. 35 Claims. (Cl. 92—11.) In apparatus of the character described, a digester having therein an indirect heat exchanger, conduits for supplying steam to said heat exchanger and directly to the interior of the digester, a conduit positioned without the digester and connecting therewith, means interposed in said conduit for circulating digester liquor through said conduit and through the digester, and a passage connecting said conduit and said circulating means with a storage receptacle whereby liquor may be withdrawn from said conduit and passed to said receptacle.

2,056,939—Apparatus for Treating Sheet Material. George C. Borden, Jr., Riegelsville, Pa., assignor to Riegel Paper Corporation, Riegelsville, N. J., a corporation of New Jersey. Application October 20, 1934. Serial No. 749,142. 17 Claims. (Cl. 91—18). In apparatus of the type described, the combination, with means for coating a continuous sheet with a solution containing a base material and a crystallizable material, of a heated tower divided into up and down flues through which the coated sheet is carried, an enclosed wash-pan associated with the top of the tower, means for diverting the coated sheet from the upper end of the up flue of the tower and passing it into and through the wash-pan and then returning it to the upper end of the down flue of the tower, means for continuously circulating a body of fluid crystal solvent through the wash-pan in contact with the coated sheet and in counter-current to the direction of its travel, and means for progressively heating the body of solvent as it circulates through the wash-pan. Apparatus for removing from the coating of a continuous sheet crystalline matter contained therein, comprising an enclosed chamber divided from inner to outer end into a plurality of transverse compartments by double-walled partitions closed at the top and of progressively greater height, steam coils located between the walls of the compartments, means for introducing fluid crystal solvent into the outer end and for withdrawing the same from the inner end of the chamber to thereby successively fill and thereafter cause a continuous flow of a body of the solvent through the several compartments thereof, and means for effecting the travel of the coated sheet first downwardly and then upwardly through said compartments successively and in a direction opposite to that of the flow of the fluid crystal solvent.

2,057,059—Treatment of Sulphite Process Paper Machine Effluent. John D. Rue, Niagara Falls, N. Y., assignor to Hooker Electrochemical Company, New York, N. Y., a corporation of New York. Application November 5, 1935. Serial No. 48,374. 10 Claims. (Cl. 92—1). The treatment of paper mill white water derived from the pulp and paper process which includes a hypochlorite pulp bleaching step, said white water containing aluminum sulphate, which treatment comprises converting said aluminum sulphate to an insoluble compound of aluminum, filtering the white water containing said compound through said pulp following said bleaching step and returning the filtrate to said process ahead of said bleaching step.

2,057,081—Paper Glazing Machine. Walter E. Brown, Reiffton, Pa., assignor to Wyomissing Glazed Paper Company, West Reading, Pa., a corporation of Pennsylvania. Application October 3, 1934. Serial No. 746,684. 8 Claims. (Cl. 92—72). In a machine for glazing continuously-fed paper or the like comprising a flat paper-supporting bed, a transversely reciprocable radius-bar polisher, a spring carrier beam for the latter provided with tensioning means to regulate the pressure applied to the paper by said polisher, and means to rapidly reciprocate said radius bar; means to approximately equalize the pressure of said polisher in its movement across said paper comprising a vibration controlling spring-tensioned support for the end of said spring carrier beam.

2,057,166—Manufacture of Sheeted Fiber-Binder Products. Milton O. Schur, Berlin, N. H., assignor to Brown Company, Berlin, N. H., a corporation of Maine. Application February 27, 1931. Serial No. 518,712. 2 Claims. (Cl. 154—2). In the production of fiber-reinforced binder materials, a method which comprises progressively suspending short-fibered, substantially individualized, dry cellulose fibers of the nature of wood pulp in a gaseous vehicle, progressively depositing the fibers from said suspension as a coherent, continuous web, wherein the fibers exist in loose, random state, progressively compacting the web to a self-sustaining condition, progressively passing the compacted web in self-sustaining condition through a bath of liquid impregnant while permitting said impregnant to contact substantially unobstructedly with substantially all of both surfaces of the web and thus to enter the body of the web substantially uniformly and to embed the web in a substantially continuous phase of said impregnant, and causing said impregnant to set in said web.

2,057,167—Manufacture of Impregnated Sheet Products. John C. Sherman, Gorham, Maine, assignor to Brown Company, Berlin, N. H., a corporation of Maine. Application January 11, 1933. Serial No. 651,106. 8 Claims. (Cl. 154—2). A method which comprises progressively depositing fiber from suspension in air into a web of substantially uniform density throughout made up of adjacent longitudinal zones, all of which progressively vary in thickness of fibrous substance transversely of the web toward a common side edge of the web, compressing said web while maintaining it at substantially uniform density, adhesively uniting the web with a water-laid felt, and bituminizing the composite sheet.

2,057,879—Art of Manufacturing Folded Paper Articles. Samuel J. Campbell, Green Bay, Wis. Application July 31, 1933. Serial No. 682,930. 9 Claims. (Cl. 270—21). The combination with means for impressing designs successively upon a continuous web, of synchronously operable folding means arranged to act upon said web to provide longitudinal folding thereof, a second folding means operable upon said web transversely thereof and arranged to register successive folds in opposite directions with central portions of the designs impressed upon said web, whereby to produce a series of convolutions each containing portions of successive designs, and means for severing the successive convolutions intermediate the design portions carried thereby, whereby to produce a plurality of rows of folded articles bearing designs in proper registry therewith.

2,058,085—Sizing Paper. Otto Kress and Charles E. Johnson, Appleton, Wis., assignors to The Institute of Paper Chemistry, Appleton, Wis., a corporation of Wisconsin. No Drawing. Application January 28, 1935. Serial No. 3,807. 17 Claims. (Cl. 92—21). The method of sizing paper comprising introducing into a furnish an aqueous colloidal dispersion of waxy material stabilized with an acid

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precipitable water-insoluble protein, the latter being present in such a quantity relative to the waxy material that particles thereof deposited on the paper fiber of the furnish are surrounded by a protein film preventing agglomeration of the waxy particles, and adding to the furnish acidic material to precipitate the waxy and protein particles on the fiber with the protein material coating the waxy particles.

2,058,224—Roll Paper Chuck. Walter C. George, St. Louis, Mo., assignor to Robert Gaylord, Incorporated, St. Louis, Mo., a corporation of Missouri. Application December 6, 1934. Serial No. 756,370. 3 Claims. (Cl. 242—72). In a device of the class described, the combination with a shaft having a key-way, of a sleeve on said shaft, a fixed collar on said sleeve, a sliding collar on said sleeve, each of said collars being provided with pockets having inclined walls, expansion bars positioned in said pockets and having inclined ends cooperating with the inclined walls of the pockets, a key carried by the sleeve, said key engaging with the way in the shaft to prevent rotation of the sleeve on the shaft and with the sliding collar to prevent rotation of the collar on the sleeve, and means for locking the sleeve against longitudinal movement of the shaft.

2,058,352—Calender Machine. Charles P. Putnam, Lockhaven, Pa., and Earl E. Berry and Lloyd Hornbostel, Beloit, Wis., assignors to Beloit Iron Works, Beloit, Wis., a corporation of Wisconsin. Application September 2, 1932. Serial No. 631,519½. 86 Claims. (Cl. 92—73). In a calender machine having a stack of calender rolls, means for applying pressure to said rolls comprising lever mechanism for imparting pressure to said rolls, a power transmitting element arranged to transmit power to said lever to apply pressure thereto, a prime mover, worm and screw mechanism driven by said prime mover arranged to drive said power transmitting element, and a compressible member located between said prime mover and said rolls to lend resiliency to the pressure applying mechanism.

2,058,657—Method of and Apparatus for Scoring Paper. William L. Angel and George K. Schray, Portland, Oreg. Application July 16, 1935. Serial No. 31,588. 5 Claims. (Cl. 101—408). A device of the class described consisting of a scoring rule, a gripper and a spring urged barrier exceeding the height of said scoring rule and adapted to be placed adjacent to said scoring rule in a manner that said barrier shall protect said rule from becoming inked but shall yield sufficiently under the pressure of said gripper during the printing operation to permit said rule to perforate the paper at the same time.

A method of scoring paper while printing consisting of protecting the scoring rule against inking during the inking operation and removing said protection during the printing operation.

2,058,791—Pulp Process. Adam Hoche, Brooklyn, N. Y. Application November 20, 1934. Serial No. 753,798. Renewed March 18, 1936. 3 Claims. (Cl. 92—9). A process of separating cellulose fibre from a fibre mass admixed with undesired other natural substances and simultaneously bleaching it which consists in substantially covering the mass with a water solution of 1% to 10% of sulphuric acid, bubbling through that solution products distilled from a reaction taking place between a fibre mass admixed with undesired other natural substances and dilute nitric acid, and then separating the liquids from the solids and washing with water until substantially acid free.

2,058,792—Pulp Process. Adam Hoche, Brooklyn, N. Y. Application November 20, 1934. Serial No. 753,799. Renewed March 18, 1936. 2 Claims. (Cl. 92—9). A process of separating cellulose fibre from a fibre mass admixed with undesired other natural substances and simultaneously bleaching it which consists in thoroughly saturating the said mass with a water solution of sulphuric acid of a concentration from 1% to 10% sulphuric acid, and then exposing the mass to the action of the product formed by bubbling chlorine gas and sulphur dioxide gas through acetic anhydride, then removing adhering liquid and water washing until substantially acid free.

2,058,961—Method of Making Plasticized Glassine Paper. Lewis Dozier, Rhinelander, Wis., assignor to Rhinelander Paper Company, Rhinelander, Wis., a corporation of Wisconsin. No Drawing. Application May 27, 1936. Serial No. 82,053. 5 Claims. (Cl. 92—40). 1. In the manufacture of glassine paper, the steps of incorporating a plasticizer material comprising glycerine, a monosaccharide and a wetting agent into a partially dried web of paper on the driers and incorporating a further amount of said plasticizer after said web has been completely dried and during the moistening of said web prior to super calendering the same.

2,059,343—Paper Manufacture. Frank Hadfield, Chillicothe, Ohio, assignor, by mesne assignments, to The Mead Corporation, Dayton, Ohio, a corporation of Ohio. Application July 25, 1930. Serial No. 470,594. 1 Claim. (Cl. 91—68). A coated paper adapted for printing and book paper, comprising a sheet having a surface coating containing approximately 70% to 85% by weight of a mineral filler including a major proportion of carbonate filler and a minor proportion of satin white, and approximately 30% to 15% by weight of a mixed starch-casein size containing approximately 90% starch and 10% casein.

2,059,464—Sizing Paper. Otto Kress and Charles E. Johnson, Appleton, Wis., assignors to The Institute of Paper Chemistry, Appleton, Wis., a corporation of Wisconsin. No Drawing. Application March 2, 1935. Serial No. 9,015. 11 Claims. Cl. 92—21). The method of making sized paper comprising providing a pulp containing a set rosin size, and particles of an alkaline earth filler material, each of said particles being coated with a film of waxy material, the latter being protected by a water-insoluble protein preventing agglomeration of the waxy particles and producing paper therefrom.

2,059,465—Sizing Paper. Otto Kress and Charles E. Johnson, Appleton, Wis., assignors to The Institute of Paper Chemistry, Appleton, Wis., a corporation of Wisconsin. No Drawing. Application March 28, 1935. Serial No. 13,577. 16 Claims. (Cl. 92—40). The method of manufacturing paper comprising forming a paper web, applying to said web an aqueous colloidal dispersion of waxy material stabilized with a water insoluble protein, the latter being present in such a quantity relative to the wax that the particles of wax deposited on the web are surrounded by a protein film, thereby preventing agglomeration of the wax particles, said web containing an acidic substance which will react with the dispersion and fix the particles of waxy material on the web fibers.

2,059,960—Machine for Compressing and Loading Articles of Flat Form. Philip D. Parsons, Swarthmore, Pa., assignor to Scott Paper Company, Chester, Pa., a corporation of Pennsylvania. Original application July 30, 1932. Serial No. 626,282. Divided and this application April 3, 1935. Serial No. 14,535. 7 Claims. (Cl. 271—87). In a machine of the character stated, means for receiving flat-shaped articles in succession and feeding them transversely to the plane of their surface, said means consisting of a plurality of rotating helically-grooved worm-like propellers arranged in pairs in parallel relation and with the grooves of each pair of propellers respectively made right- and left-handed, and a flat traveling belt-like carrier support for the paper articles arranged in a plane below and substantially parallel to the axes of the worm-like propellers, whereby the paper articles are supported while being propelled by the propellers.

2,059,979—Web Handling Apparatus. Walter S. Aiken, Lee, Mass., assignor to The Clark-Aiken Company, Lee, Mass., a corporation of Massachusetts. Application October 2, 1935. Serial No. 43,247. 10 Claims. (Cl. 271—2.2). An apparatus of the class described comprising in combination, spaced uprights, rails on said uprights, a row of spaced rolls on said rails, a platform movable up and down in said uprights, a row of spaced rolls on said platform, sprockets on said rolls, driving means in a fixed position having a driving sprocket, an endless chain engaging said sprockets, and means to move said platform up and down in said uprights, all adapted and arranged whereby the said chain and sprockets are in operative engagement while the platform is moving up or down or is stationary.

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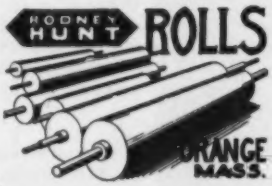

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The COMMERCIAL OUTLOOK

New York, January 2, 1937.

NOT in years has a new year opened with prospects so promising for the paper and pulp industry. Having experienced marked improvement over the last few months, paper manufacturers now appear on the threshold of one of the busiest, and perhaps most prosperous, years during 1937 they have ever known. All indications seem to point to a further pick-up in general business, of additional expansion of consuming markets, of gradual improvement in the heavy industries and other lines which have not kept pace with the uptrend in most manufactures, and of a solidifying and more firmly establishing of the gains thus far achieved.

A preliminary compilation by the Federal Reserve Bank of New York shows that the volume of production and trade in this country during 1936 was approximately 15 per cent above the 1935 total. This was a substantial increase, when it is taken into consideration that a fair rate of gain was scored also in 1935. The estimated volume of business for last year was about 45 per cent greater than in the low year 1932, and was the largest since 1930, coming within 3 per cent of that year's total. The report notes that the rate of recovery has been considerably accelerated in the last two years.

The paper industry begins 1937 in perhaps a livelier condition, from an immediate standpoint, than ever before has been witnessed. It is something approaching proverbial that as the end of a year draws near, activity in the paper market subsides. Buyers in a large majority of cases withdraw temporarily, and manufacturers—engrossed with inventories or mill repairs or other matters—do not press to secure business as they do at other times of the year. There is almost invariably a distinct lull in market activity in the closing weeks of a year, and until the new year gets under way.

Not so at present, however. There was no lull in paper industry activity during December, as the holiday and inventory season drew on. Business in paper kept right on growing; there has been a near scramble among consumers, converters and jobbers to cover their forward needs for a time, and paper board manufacturers have been figuratively deluged with orders for their products. The demand has gained momentum, seemingly without any checking whatever during the holidays. Thus, paper manufacturers enter the new year with a large volume of orders on their books, with demand evincing no signs of abating—rather of assuming broader dimensions—and with paper and board machines droning a tune of steady production on a large scale, yet scarcely large enough to satisfy the wants of the consuming market.

Latest compiled ratio statistics show that the paper industry is producing at 88.0 per cent of rated capacity as an average for the month of November, increasing to a preliminary average of 92.1 per cent for the first part of December. This represents a large rise over a year ago, the averages for November, 1935, being 75.3 per cent, and for December, 1935, 71.2 per cent. For 1934, the figures show 61.7 per cent average for the month of November, and 59.5 per cent for December. A comparison of these production bases discloses the tremendous increase in manufacturing activity in the industry during recent months.

The newsprint industry in the United States and Canada made giant strides in 1936 toward putting production back at the record level of 1929. At the same time it made only negligible progress toward restoration of the price level. The total output of print paper in the two countries last year will doubtless exceed 4,000,000 tons, but likely will fail to reach the 1929 record of 4,121,000 tons. Production last year showed an increase of approximately 11.4 per cent over 1935. The probability of increased advertising in 1937 augurs for record-breaking newsprint production this year. The general index of advertising in Printers' Ink shows a gain for November of 14.7 per cent over the same 1935 month, while the November increase over the preceding month was 1.4 per cent.

Newsprint production in Canada during November continued to run at record levels. United States output, while greater than in the same month of 1935, continued far behind the production of the late 20's, and the total for both countries was less than 200 tons below the record output in November, 1929, according to figures reported by the News Print Service Bureau. Canada produced 285,771 tons in November, against 262,854 tons in the same 1935 month, while United States production amounted to 79,853 tons, against 78,929 tons. The total for both countries was 365,624 tons, compared with 341,783 tons in November, 1935.

During the first eleven months of last year Canadian mills manufactured 2,890,602 tons of newsprint, contrasted to 2,508,003 tons in the corresponding period of 1935, and United States production was 840,269 tons, against 839,938 tons, making a combined total of 3,730,871 tons, against 3,347,941 tons in 1935. This was about 40,000 tons under the 1929 record for eleven months. Shipments from Canadian mills during November were 293,075 tons, and from United States mills 80,221 tons, an excess of shipments over current production of nearly 8,000 tons, so that stocks at mills were reduced to 68,167 tons on November 30 in both countries, compared with 75,839 tons at the end of October last year, and 63,112 tons at the end of November, 1935.

Production of paperboard in the United States reached the very high level of 359,905 tons of all kinds of board during October, compared with 328,519 tons in the preceding, and 345,596 tons in October, 1935, making a total for the first ten months of 1936 of 3,007,278 tons, against 2,756,171 tons in the similar ten months of 1935, and 2,404,433 tons in 1934. Mills produced at 82.8 per cent of their rated capacity in October last, the highest point in three years or longer, and during the first ten months of last year produced at 72.3 per cent average, against 67.9 per cent in the same time of 1935 and 60.3 per cent in 1934. New orders received by manufacturers in October called for a total of 360,687 tons of board, comparing with 353,197 tons in the month before and 351,887 tons in October, 1935. Unfilled orders held by mills at the end of October were for 138,830 tons, contrasted with 135,732 tons a month earlier and 107,074 tons a year previously.

Paperboard prices are reported now, on the average, the highest since 1929, with the exception of three months in 1933 when the rate of production was considerably under the present output level. Figures lately compiled show that kraft board production in the United States has increased 17 times since 1926, while total board production has risen only about 13 per cent. Increased capacity amounting to more than 2,800 tons daily, or about 840,000 tons a year on the average of 300 days' operation a year, was either started or announced in 1936, which amounts to an increase of well over 40 per cent of the 1935 production of all kraft paper and board.

While falling below the total of the preceding month, shipments of prepared roofing from mills in the United States continued on a high level during October, amounting to 3,895,839 squares, against 4,284,205 squares in September last and 3,064,499 squares in October, 1935, according to the monthly report of the Census Bureau. Ten months' shipments last year totaled 28,149,321 squares, contrasted to 22,967,604 squares in the same 1935 period, a gain of 22.5 per cent.

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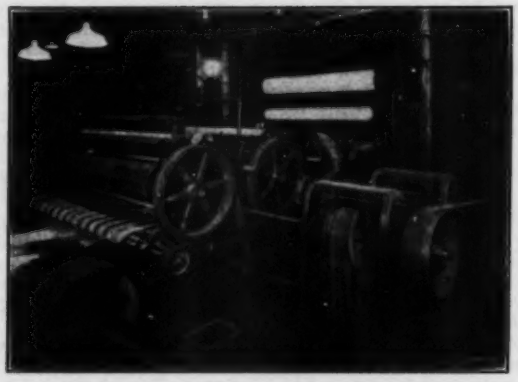

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Domestic RAW MATERIALS

◆ Papermaking Rags

Although showing a rather quieter condition during the holiday and inventory period, papermaking rags have been characterized by an extremely strong price tone. More and more it is becoming evident that a scarcity—a potential serious shortage—of some classes of rags for papermaking definitely exists. This situation is particularly observable in the lowest grade, or rags for roofing paper manufacture. No material difficulty has yet been experienced by paper mills in securing all of the better grades of rag stock they have required, but the greatly increased demand has made such deep inroads on available supplies of some descriptions of new cotton and linen cuttings that market values of these rags have been pushed substantially higher, and the outlook is none too favorable for paper manufacturers.

The supply position in roofing rags unquestionably is due to the foreign situation. No longer are roofing felt manufacturers enabled to supplement the domestic accumulation of rags for their needs through the acquisition of sizable tonnages of rags abroad. Europe is using its rags to a greater extent than ever before; a vastly increased consumption there not alone has cut down the supply available for export to the United States, but prices have been run up in the European markets to where they are a good deal higher than prevail here, so much so that manufacturers in this country are reluctant to pay the prices demanded from abroad.

What may happen during 1937 is a moot question. Certainly, prospects seem dangerous, from the consumer's viewpoint. This much appears assured, that should the building movement attain the lengths predicted for it in 1937, a dire shortage of roofing rags likely will develop. Building experts, and including U. S. Department of Labor officials, forecast an increase of between 50 and 60 per cent in residential construction in the United States during 1937 as contrasted to 1936, or the erection of a total of approximately 400,000 new homes throughout the country this year. Should residential building expand in keeping with such estimates, effecting an increase in consumption of roofing and building paper in like proportion, there seems no gainsaying roofing rags are going to be scarce as well as high-priced.

New high prices have been paid for foreign roofing stock. Felt manufacturers have bid 2.20 and 2.25 cents per pound, ex dock Atlantic seaboard basis, for dark-colored cottons, and 2.65 cents for linsey garments. It is probable that prices in excess of these have been met in some cases. Importers report they are no longer able to sell at these figures for the reason that they are quoted higher prices from abroad, with European dealers adopting an independent attitude and paying scant attention to bids below their asking bases.

Domestic roofing rags are very firm, but are quoted at prices far under foreign rag levels. No. 1 domestic roofing stock is selling at 2.10 cents to slightly higher per pound f.o.b. dealers' shipping points in the East, this grade corresponding to imported linseys, while No. 2 domestic roofing rags are 1.65 to 1.70 cents a pound, this material comparable with foreign dark cottons.

Dealers with few exceptions are asking 8.25 to 8.50 cents per pound at shipping points for No. 1 new white shirt cuttings, and frequently quote above these prices. New light silesias are priced at 6.50 cents f.o.b. dealers' points, blue overall cuttings at 7.25 cents, unbleached muslins at 8.75 to 9 cents, bleached canton flannels at 8.50 cents, light flannelettes at 7 cents, fancy shirt cuttings at 3.25 cents, and washables at 2.75 to 3 cents. New white linen cuttings are about 11 cents, and grey linen cuttings 10 cents a pound.

Old white and blue cottons are relatively quiet, and quoted at 3.75 to 4 cents per pound for No. 1 repacked whites, 3.25 to 3.50 cents for No. 2 whites, and 2.25 cents for repacked thirds and blues.

◆ Rope and Bagging

Prices of old rope and scrap bagging have moved to advanced levels. No. 1 old manila rope has sold to paper mills at 3.25 cents per pound, ex dock New York for foreign and f.o.b. shipping points for domestic. Available supplies are declared to be light, and the market is pointed sharply higher. No. 1 scrap bagging is approximately 2.10 to 2.25 cents a pound at dealers' points, with the probability that some sellers ask above these figures. Roofing bagging is firm at 1.70 cents f.o.b. shipping points, and difficult to locate in sizable lots.

◆ Pulpwood

There is every evidence there will be a considerable increase in the output of pulpwood in various cutting regions of Canada this season. Prices paid to individual cutters are from 25 to 50 cents more per cord, and the market is stronger than in a long time.

◆ Mechanical Pulp

Consumers are looking more to Canadian groundwood than usually to cover present requirements, owing to relatively higher prices quoted on Scandinavian groundwood. Canadian producers are accepting around $20 per ton f.o.b. pulp mills for prime moist groundwood, or about $24 ex dock New York or other American Atlantic ports, the delivered consuming mill prices figuring out at between $27 and $32, depending on the freight haul. Domestic groundwood is quoted on practically this same basis, with little supply on offer since manufacturers have limited tonnage above their own needs for sale. Scandinavian dry groundwood is $29 to $30 per short ton ex dock American Atlantic seaboard for forward shipment from abroad.

◆ Chemical Pulp

There is a wide difference in quoted prices of domestic wood pulp and imported pulp of European origin. Domestic manufacturers are naming 2.70 cents a pound ex dock Atlantic seaboard for prime bleached sulphite for delivery during the first quarter of 1937, this price being to contract customers, and virtually no supply available in the open market. Scandinavian bleached sulphite has sold at 3.60 cents for shipment from abroad, also ex dock American Atlantic ports. Domestic unbleached sulphite is scarcely available and is nominally quoted at 2.25 to 2.35 cents or thereabouts per pound, while domestic No. 1 kraft pulp is nominally 2.50 cents at pulp mills, and domestic bleached soda pulp 2.70 cents on a delivered consuming mill basis.

◆ Chemicals

Papermaking chemicals are moving freely and are firm quotably. Contract quotations are being revised upward in some instances.

◆ Old Paper

For the first occasion in perhaps many years, the waste paper market passed through the holiday and inventory season without price recession. Demand has kept up in large volume, and steady buying by consumers has removed practically all the tonnage offered from supply sources, this being a reflection of the busy situation of box board and also paper mills.

All grades exhibit price firmness, but book stock, kraft descriptions and ledgers are in the forefront in this connection. No. 1 old books and magazines are selling in the East at 85 and 90 cents per hundred pounds f.o.b. shipping points, the highest price level attained by this grade of paper stock in several years. No. 1 old kraft paper is 1.15 to 1.30 cents a pound, according to quality of packing, while new kraft envelope cuttings are bringing 2.25 cents, if not more. White ledger is selling at 1.30 to 1.50 cents a pound, and colored at 95 cents to $1 per hundred pounds. No. 1 hard white envelope cuttings have advanced to 2.75 cents a pound at shipping points, No. 1 hard white shavings are 2.25 to 2.50 cents, and No. 1 soft white shavings 2 to 2.15 cents up to 2.50 cents for one-cut grade. Folded news is selling at 57½ to 60 cents a hundred pounds in the East, No. 1 mixed paper 45 cents, and old corrugated boxes 62½ to 65 cents.

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Import and Export MARKETS

IMPORTS

◆ Wood Pulp

A truly runaway market has developed in imported wood pulp. Prices have advanced figuratively by leaps and bounds, and are now on higher levels than have been registered in a long while. Price unmistakably is a secondary consideration to numerous paper and board manufacturers in their eagerness to cover raw material requirements, and to say that some consumers have "missed" their market and have pressing needs which they are experiencing decided difficulty in filling is not exaggerating the situation one whit.

Virtually a scramble for pulp supplies has been noted during the last few weeks. Consuming buyers are seeking spot lots of pulp, shipments from primary sources abroad all through 1937, and also supplies for 1938. The demand has been so active and urgent that prices have been pushed upward at a rapid pace, and the price condition has reached a stage where it is hard to determine exactly what market levels really are.

Sales of foreign prime bleached sulphite for 1937 shipment from Europe have been made at 3.55 and 3.60 cents, and probably higher, ex dock New York or other American Atlantic ports. By the time this appears in print, this price level may prove to be low, judging by the rapidity of the market's advance. Consuming buyers have paid 2.60 cents a pound, ex dock Atlantic seaboard, for prime strong unbleached sulphite, and it is nothing out of the ordinary for sellers abroad now to demand 2.70 cents and to refuse to entertain bids under this price. Scandinavian prime kraft pulp has been sold at 2.65 cents per pound ex dock Atlantic seaboard for prompt or near delivery, while prime kraft for shipment from Europe in 1937 is quoted at 2.50 cents or more, with a nominal basis of 2.25 cents upwards named for 1938 shipments.

Offerings from producers abroad have almost ceased. Pulp manufacturers in Sweden, Norway and Finland, as well as other countries in Europe, are outsold for the current year; it is asserted that in numerous cases producing mills abroad declare they haven't a pound of additional pulp to dispose of for 1937. Few are willing to contract for 1938, even at the comparatively high prices now prevailing. There has been a tremendous expansion of demand for pulp, not from the United States alone but from practically every pulp-consuming nation. There is reason to believe big tonnages of chemical pulp have been bought for war munition purposes, for gun cotton particularly; the rayon industry has absorbed much larger supplies than ever before, and paper manufacturers all over the world have purchased pulp eagerly and actively. Indications are the 1937 production is outsold; it is possible, of course, that some tonnage remains in the hands of producing interests, but pulp manufacturers are absolutely averse to committing themselves further for this year, and are holding back making 1938 offerings.

As stated, prices at present are strictly a nominal matter. Bleached sulphite of prime grade is anywheres from about 3.50 cents a pound upwards for delivery over 1937, easy bleaching sulphite from 2.75 cents upwards, prime strong unbleached sulphite 2.50 cents to higher levels, and prime kraft about a minimum of 2.25 cents for 1938 shipment from abroad and 2.50 cents for the current year. Scandinavian prime dry groundwood is $29 to $30 per short ton ex dock American Atlantic seaboard—with sales definitely recorded at the $30 level—and $26 to $27 for moist groundwood.

Imports of pulp into the United States continue on a large scale. During October a total of 179,718 short tons of 2,000 pounds, air dry weight, of chemical pulp, valued at $6,949,878, was imported, showing a small decrease from the 186,558 tons of a declared value of $6,989,193 imported in the month preceding, and comparing with 204,154 tons of a value of $7,733,386 in October, 1935. Importations for 1936 undoubtedly established a new high record for all time, and by a wide margin.

Groundwood imports in October amounted to 21,046 short tons of a value of $404,193, contrasted with 25,163 tons of a value of $432,094 in September last year, and 27,765 tons of a value of $479,824 in October, 1935. Imports of this pulp in the first ten months of 1936 totaled 180,131 short tons, compared with 143,847 short tons in the same time of 1935.

◆ Paper Stock

Importations of rags for papermaking purposes during 1936 ran almost double the volume of the 1935 receipts, judging from figures covering the first ten months of last year. Department of Commerce figures show that October imports were 16,176,474 pounds, valued at $312,512, making a total for ten months of last year of 240,378,914 pounds of a declared value of $3,929,464, comparing with 159,382,506 pounds of a value of $1,909,115 imported during the similar ten-month period in 1935. Imports of other paper stock, comprising old rope, bagging, waste paper, etc., in October last amounted to 8,323,564 pounds of a value of $186,539, making a total for the first ten months of 1936 of 86,098,680 pounds for a value of $1,510,534.

◆ Paper

The United States imported paper and paper products for an aggregate value of $89,301,904 during the first ten months of 1936, including arrivals of a value of $10,453,967 in the month of October last. This represented a sharp increase, or imports of a value of $14,397,493 for a gain of 19.2 per cent, over the aggregate receipts worth $74,904,411 in the corresponding ten months of 1935. Newsprint of course comprised the great bulk of these imports, receipts of standard news in ten months last year reaching a value of $78,016,595, as against $65,691,577 in the same time of 1935. Next in importance was cigarette paper, valued at $3,336,377 in ten months of 1936, against $2,796,551 in 1935, followed by kraft wrapping paper valued at $1,242,952.

EXPORTS

Exports of paper and paper products from the United States in October were valued at $1,986,246, according to U. S. Department of Commerce statistics, making a total for the first ten months of 1936 of $18,736,629. This was a rise of 10.7 per cent over the exportations having a value of $16,919,902 in the first ten months of 1935.

The largest item, in point of total value of shipments, of paper exports from the United States last year was writing paper, exports of which had a value of $1,698,820 in ten months, contrasted with $1,384,245 in the same period of 1935, followed by wrapping paper other than kraft of a value of $1,637,008, against $1,517,225 in the preceding year. Exports of greaseproof and waterproof paper in ten months of 1936 were valued at $1,296,752, against $941,951 in the same 1935 period; of fiber insulating board, $1,185,493, against $1,076,595; of boxboard, $1,036,027, against $952,226; of other paperboard, $860,688, against $839,784; of paper bags, $638,819, against $612,055, and of paper boxes and cartons, $611,786, against $528,744.

Exports of paper base stocks from the United States were valued at $10,416,916 during the first ten months of 1936, compared with $7,764,594 in the corresponding 1935 period. Sulphite wood pulp comprised the bulk of these exports, amounting in value to $8,998,888 last year, against $6,458,615 in the first ten months of 1935.

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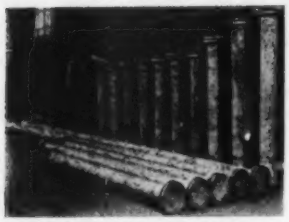

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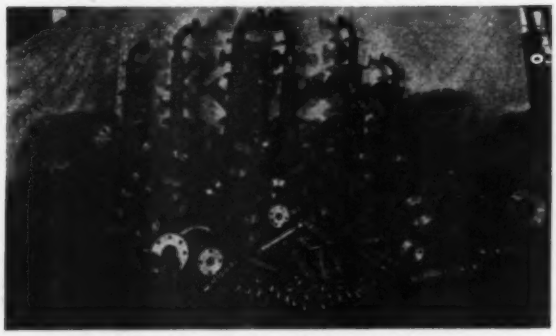

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